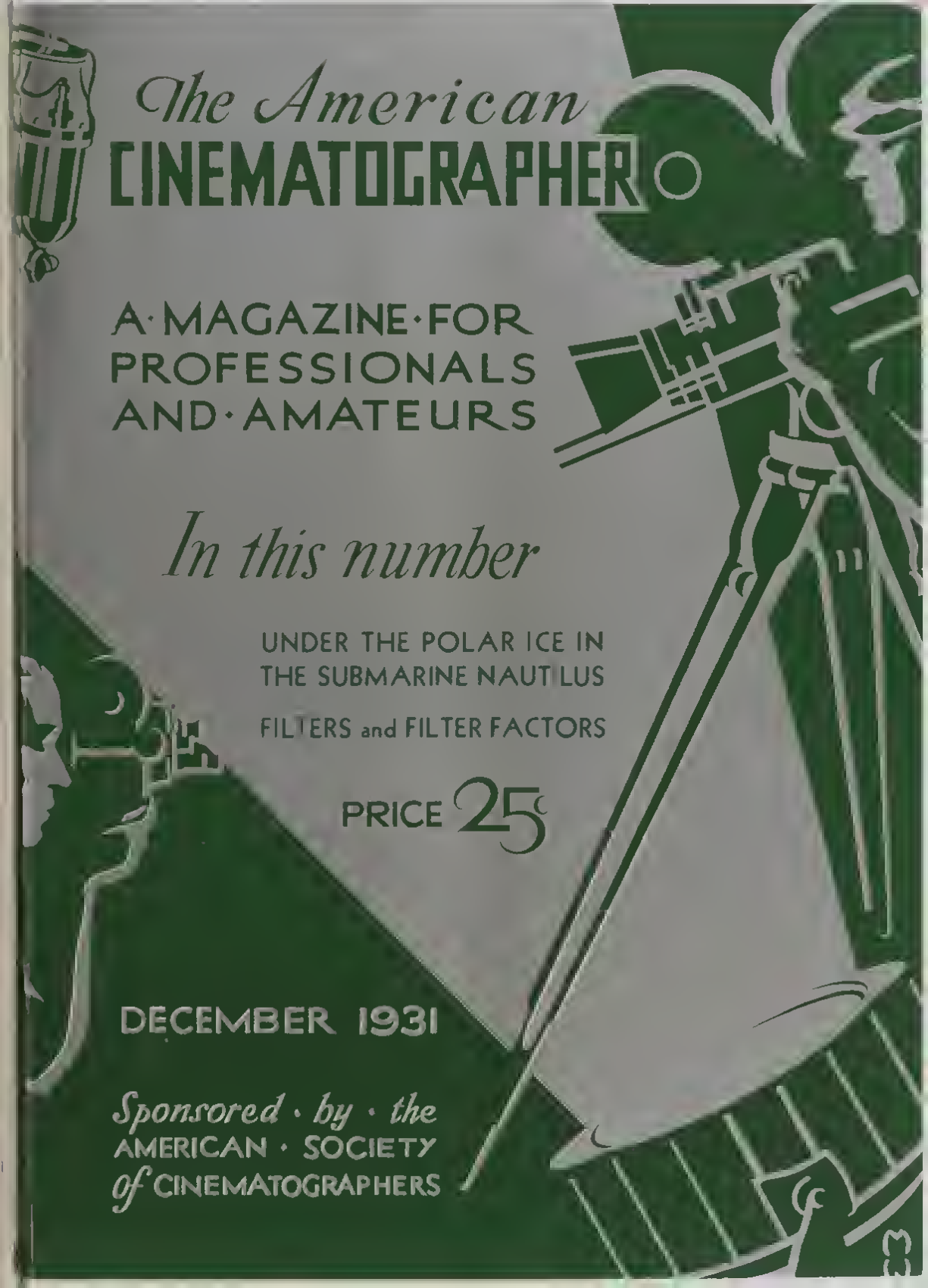

The American CINEMATOGRAPHER

A·MAGAZINE·FOR PROFESSIONALS AND·AMATEURS

In this number

UNDER THE POLAR ICE IN THE SUBMARINE NAUTILUS

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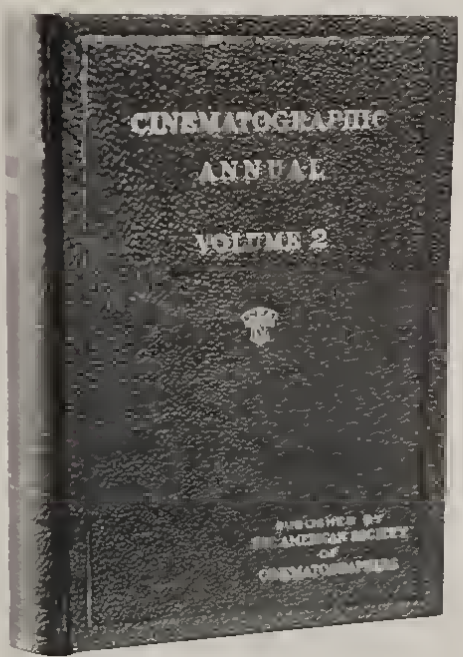

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UNDER THE POLAR ICE IN

by **JOHN D**

Paramount So

● When an entire world was waiting anxiously last summer for word of either the failure or success of Sir Hubert Wilkins in his attempt to reach the North Pole in a submarine, far beneath the great mass of Polar ice, there was a Cameraman, as usual, in that little vessel. A Cameraman, tearless enthusiastic, ready to give his life, if need be, to bring back photographic records of the feat that had a world on edge. The cameraman was Mr. John Dored, member of the American Society of Cinematographers. Here we present to you Mr. Dored's rather modest account of the adventure. With his characteristic modesty Mr. Dored suggested that someone had better rewrite it as he felt that he was not a writer. That would be a shame, for Mr. Dored has given us a word picture, the excellence of which lies in the fact that it lacks ornateness and floweriness of phrasing.—The Editor.

THE BEST and only season for Arctic explorations are the summer months—June July and August. During that time the sun shines brightly twenty-four hours a day, with the average temperature ranging from 10 to 25 degrees Centigrade above Zero, the atmosphere very clear, with no strong winds. Later in the season comes a period of dense fogs, rain, hail, snow and continual darkness.

Due to many mechanical mishaps with the Nautilus the expedition did not reach Spitsbergen until the end of August—just at the start of the bad season. The hardships which we encountered on our way from Spitsbergen to the Polar ice fields and back were really very great. Except for a couple of sunny days we had nothing but fog, rain hail and heavy storms during our three weeks in the Polar field. On the first day of our contact with the Polar pack ice the diving rudder of Nautilus was cut away by a deep-sitting piece of ice. That was a terrific blow, for a submarine without a diving rudder is just an ordinary surface vessel. However, due to the skill of the submarine specialists aboard we made several dives under the polar ice, anyway.

Those were moments never to be forgotten—the moments just before the dives. "Chances are" said the specialists, "we will never come up again if we make the dive." But the decision was made to try it. It was a tense moment when Captain Danenhower gave the order, "Everybody at his station for a dive." I watched the faces of the men. They looked serious, and I imagine they all, like myself, were wondering if we would ever come up again.

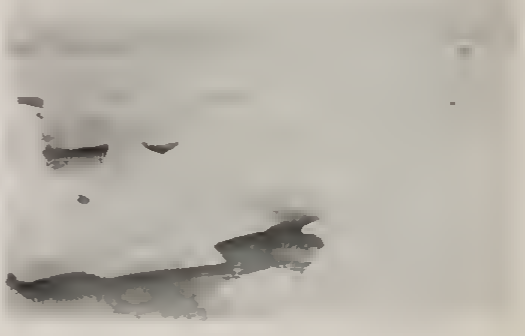
Mr. Dored on board Nautilus

To photograph the under-ice pictures I took my station in the escape hatch at the Eye Port, a circular window of about four inches in diameter, and fitted with a thick glass. Through this I could see outside, and through it I took the pictures with an automatic DeVry camera while we were submerged. The escape hatch was just big enough to hold one man and a small camera without a tripod.

As soon as we started to dive I pressed the camera lens close to the window and took the pictures. I could not see what I was photographing for the camera covered the window. So it was all guess work as far as volume of light for exposure was concerned. But I can say now that there is plenty of natural photographic light to a depth of forty feet. One can see clearly to a distance of from six to nine feet. Beyond that it is just a haze. The sight of the Polar ice as viewed from beneath is simply a thing of marvelous beauty—indescribable, unforgettable. It is like a world of fancy, the ever-changing ice formations with colorings from pure white to a deep, bluish green, with a dim background, gives the impression of an unreal dreamland. For that sight alone, it has been worth while to live, to suffer and take all the risks.

Living conditions on the Nautilus were extremely hard. All free space was occupied by scientific instruments, Polar equipment and food sufficient for two years. Everybody suffered from cold and dampness. Due to condensation within the

Nautilus starting her homeward journey.



A view of the Polar ice pack.

THE SUBMARINE, NAUTILUS

ED, A. S. C.

ews Staff Reporter

Nautilus, water was dripping from everywhere, and now and then a big sea would find its way through an open hatch while we were running on the surface For a period of three weeks, undressing for a short sleep was impossible because of cold and dampness The water supply for cooking and drinking became frozen, and we had to use water from a fuel tank which smelled like kerosene oil But everybody kept on smiling and our little phonograph played "Good-night Sweetheart" music, and Captain Danenhower on special occasions served us with a mug of good rum

On our way back to Spitsbergen we encountered a real Arctic storm which lasted two days As we closed the hatches for the run through the storm we saw three huge icebergs Our periscope became coated with ice and we could not see the surface so we went on—full speed ahead—through the storm towards Spitsbergen Outside was a raging storm and masses of ice threatening us momentarily, but we ran blind and made it

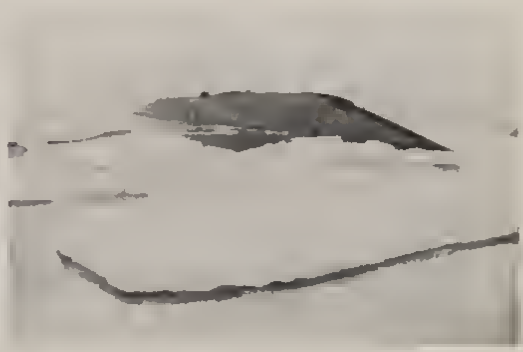
How we did it without crashing into one of those mountains of ice will always be a mystery to me I guess some guiding hand must have been watching over us, caring for us, protecting us From the very beginning of the expedition, trouble seemed to follow good, old Nautilus, and only the courage and determination of Sir Hubert Wilkins carried the expedition through to a safe ending Many a man would have given up when the engine trouble developed in the crossing of the Atlantic But not Sir Hubert Truly there is a REAL man and a born leader, a man whom strong men will follow into any danger When we were about to make our first dive under the ice, with our diving rudder gone, his courage and his characteristic calmness almost made us forget the fact that we would perhaps never come to the surface again But with a man like Sir Hubert leading you, you smilingly step into any danger

Left to right Mr Dored Captain Danenhower and First Officer Schlassbach

The results obtained in the scientific field were highly satisfactory In fact, the results were even bigger than had been hoped for or expected All on board, naturally, were disappointed because of the delays and accidents which shortened the period in which we could carry out our work If we could have been in the Polar waters earlier in the summer with our ship in good working condition we undoubtedly could have made sensational discoveries I sincerely hope that Sir Hubert will be able to organize another similar expedition with a new submarine especially designed and built for the Polar work If he does, I hope I shall be one of those on board The experience of the first trip will stand me in good stead, and I am certain I shall be able to bring back photographic results that will be extremely valuable I want to get those beautiful under-ice pictures, with all their colorings, just as they are—in color

And now I am again in Spitsbergen for the last act of Nautilus She will be sunk one of these days I feel sad about that old boat, our dear friend now She has carried us safely through the dangers and hardships, but is, herself, condemned to die Glory to her!

Tha Nautilus as she was going under tha Polar ice



Nautilus running partly submerged, through tha ice pack

The Challenge of Direct Color*

by **JAMES N. DOOLITTLE**

IN DISCUSSING that photographic phenomenon by which it becomes possible to reproduce with sensitized materials, the colors of practically the entire visible spectrum, it is interesting to pause and reflect that we have but lately found a feasible working out of theories well known to the earliest experimenters

Indeed, the practices which are, by now, a matter of routine, were described in veriest detail many years before the discoveries which have made direct color possible

Interesting, too, is the observation that photography—since its inception, a tool of the artist—was early called upon to supply not only form and outline, but color itself, so that the hues of nature could be the more faithfully—and leisurely—translated into pigment upon canvas Wedgwood, son of the eminent potter, first utilized photography in its most elemental form to transfix the images of leaves and floral forms for purposes of design, while at a much later date we find Samuel F B Morse, the portrait painter, endeavoring to capture the evanescent mood of his subject photographically—meanwhile finding time to invent the telegraph. That his efforts to capture moods were not too successful may be partly due to the fact that exposure in bright sunlight was a matter of several minutes!

Perhaps it is well for photography in general that early attempts along lines of direct color were unsuccessful, for much progress was made in monochromatic work—and the art brought to a high state of perfection by the latter part of the last century

To Ives, inventor of the half-tone process, is attributed certain important advances in color, and it appears that he was among the first to introduce a method of producing separation negatives" by simultaneous exposure with a means of subsequent processing by which a print was made in full color The war interrupted developments which would, no doubt have led to an earlier realization of a long-sought goal

Upon two major discoveries depends the production of direct color as we now know it: the anastigmatic lens and the panchromatic emulsion The speed and accuracy of the modern objective, together with a sensitized surface capable of quickly and selectively accepting the colors of the visible spectrum, is the combination essential to results which have now reached an advanced stage

While in our present enlightenment we are able to make no extravagant claims, realizing that much yet remains to be accomplished, direct color is here; vehicles for its application abound, highly creditable work is being done and in a way that has placed it above many restrictions hitherto imposed

The immortal, however, who gave expression to that phrase which established the unassailable veracity of the camera lived in an era far remote His myopic vision did not encompass the color camera of today which, I am afraid, has adopted Ananias as its patron saint!

The color photograph is the result of no automatic procedure Care, calculation—yes, some luck—are matters strongly depended upon to combat variable and contrary factors too numerous to contemplate and while we do not wish to leave the impression that the best color work is a successful courtship with the goddess of chance it is pointed out that it is amenable to few of the rules which are more or less taken for granted in monochromatic work Perhaps it is best that we employ the term "judgment" as a sort of cover-all requisite for the making of a color print; then if the result seems to take liberties with fact we may simply weigh your judgment against ours

Which brings us close to another point Two elements enter into an appraisal of any color work the analysis of actual tints and hues and, a less tangible value, **color sensation.** It would be futile to expect a color-blind person to get the proper esthetic thrill from a picture no matter how nearly it approached perfection Perhaps, on the other hand, one in full possession of his optical faculties would experience no joy in a master painter's conception of a glorious sunset Color sensation again.

We are all, in a sense, color blind Differently stated, we possess idiosyncrasies of particular color susceptibilities The male of the genus **bos** is popularly supposed to react belligerently to red It would be ruinous to expect him to placidly contemplate a painting of certain sunsets which we have rapturously beheld! Trained to a literal acceptance of camera images as entirely life-like, we automatically expect of direct color pictures an impossible—yes, often an undesirable adherence to fact. We know (?) that the unclouded sky is blue and blue it must be in the picture But we do not stop to analyze the matter of **how** blue it is In this instance, our judgment is as good as yours, for perhaps we have reproduced it exactly as we saw it It may not **please** you—that's a matter of taste Let us say, a matter of individual response

We recently made a picture which, readily accepted as a piece of successful color rendering, was criticized because shadows cast by the objects were of bluish tint This individual couldn't explain just what color shadows ought to be but was reasonably certain that they shouldn't be blue While most photographers in colors recognize the ready tendency of either the blue or red component of the image to predominate, this is easily controlled where such preponderance is objectionable, but whether or not it **is** objectionable depends upon individual reaction to such hues Here, again, we touch upon that which is expected of the camera Is our instrument dealing lightly with the truth or is it more accurate than our own eyes?

Or, let us forsake, for the time being, our analytical faculties We either like a thing or we don't No explanation will help, for there is none Do you thrill to the music of Debussy or does Al Jolson strike a more responsive chord? Perhaps you like both That's better, you'll like my pictures But seriously, your pleasurable reaction to one does not brand the other as either good or bad music Individual susceptibility

So far I have dealt merely with the finished photographic print which, if this be all that is desired, closes the book

But suppose we are commercially minded and tri-color reproductions are wanted either for magazine "art", posters, cartons or whatnot Here enters the photo-engraver He is a particular sort of chap who thinks that our pictures are probably all right in a way, but he doesn't seem especially interested in them except as a guide to his subsequent operations In this print he sees what colors are aimed at and forthwith proceeds to make a set of plates Meanwhile, he has used our negatives from which he has made three—sometimes four—negatives through a screen upon glass and to the approximate size of the finished impression

*Printed through the courtesy of Adcraft, Printers and Engravers, of Los Angeles, who furnished color plates used in this article—The Editor

Photograph by James N. Doolittle

Miss Betty Bucklaw

Photograph by James N. Doolittle

Three-Color Camera, repeating-back type, constructed by Mr Doolittle With it three 5x7 color corrected negatives may be made in an interval of 3 seconds

Each of our three negatives is correct in balance, contrast and register so his work is purely mechanical, is it not? Yes, emphatically, it is **not.** Our skies, which in this instance, actually turned out a true cerulean, need a whole lot of work, for although that part of our picture was composed of a certain admixture of the primaries, red, blue and yellow he can use but one—blue—with possibly a very little of the red So he puts the red and yellow plates on a machine which does things in a hurry with a very sharp little rotary bit. A little hand tooling and the unwanted colors are gone You see, in our paper print we work in what is known as "continuous tone", in which all color is a mixture of the three primaries, one over the other Even perfectly neutral greys are composed of these, distributed in practically equal amounts But in half-tone, various tints are created by the juxtaposition of these colors in the form of very minute dots separated by white paper Therefore bits of all the colors are everywhere visible, which, without

(Continued on Page 22)

Lens Testing

by **DR. L. M. DIETERICH**
Consulting Engineer

Editor's Note This is the second installment of a series of articles on Lens Testing by Dr Dieterich The first appeared in the November issue of this magazine If you missed that issue and wish to have the complete series copies of the November issue may be obtained from the office of the American Cinematographer In the first article Dr Dieterich discussed the test of focus giving the method and the equipment needed This month he starts with Speed as the objective

Test No 2 . . Object of Test . . f, Speed

METHOD OF PROCEDURE

Check rated speed by measuring free aperture diameter Ad, Fig 5 and insert in formula $f = \frac{\text{Focus}}{\text{Ad}}$ Read f from test No 1 Read Ad in mm

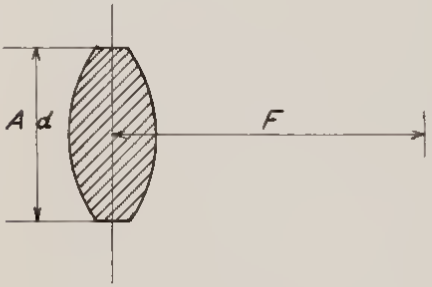


Fig 5

Test No. 3 . . Object of Test . . Absolute Speed

METHOD OF PROCEDURE

(Under absolute speed, a f, the f speed of a lens with 100% light transmission is meant)

After light transmission f of test lens in % value has been determined for test lens under Test No 1, the f speed as determined under test No 2 is divided by per cent value f resulting in $af = \frac{f}{t\ \%}$ Example If test lens was rated as f 2 5 determined by test No 2 as f 2 6, light transmission under test No 4 found as 89%, then the absolute speed is $af = \frac{2\ 6}{.89} = 2\ 92$

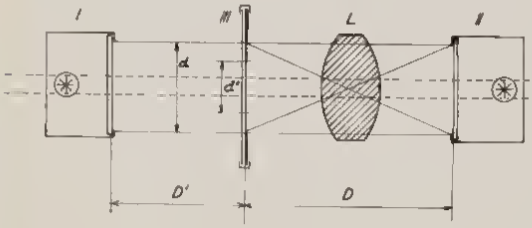
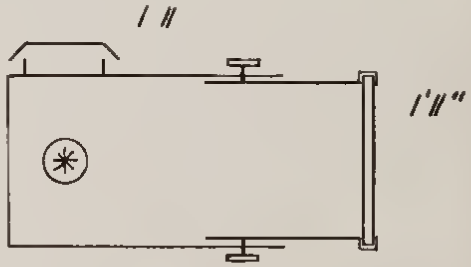


Fig. 6

Object of Test . . . Light Transmission

METHOD OF PROCEDURE

1. Calibrate two lamp (bulb) houses, I and II, Fig 6, for even luminosity of ground glass plates I' and II', Fig 7, with circular apertures, d = 25 mm (approximately)



Top Fig. 7 Bottom, Fig 8

2. Place in plateholder III Fig 6, ground glass plate III Fig 8, with 25 mm diameter opaque diaphragm mat, central circular spot of 10 mm diameter of finer ground grain
3. Place ground surface of III' at D, Fig 6, 5 m from ground surface of II', light both bulbs and slide I on bench until gr', Fig 8, disappears Then measure D'
4. Replace III' and II' by square ruled plates O and I, as used in test No 1 (Test for Focus in last installment), etched surfaces in places of ground surfaces
5. Place test lens between II and III with bulb II only lighted, and slide until projected pattern of plate at II coincides with pattern of plate at III Fix position of lens (1 1 magnification)
6. Remove square ruled plates and replace II' and III'
7. Light both bulbs and slide I until gr' disappears
8. Measure D" and divided into D' (D">D')
9. Light transmission of test lens L in per cent then will be

$$t\ \% = \frac{D'}{D''}$$

(To be continued)

New Filters for Exterior Photography With Super-Sensitive Film

by **EMERY HUSE** and **GORDON A. CHAMBERS**
West Coast Division Motion Picture Film Department Eastman Kodak Company

IT IS often desirable in photography to alter physically the spectral quality of the light by which a picture is to be made This alteration of quality can be readily accomplished by the use of light filters A light filter in photographic terminology is usually a piece of dyed gelatin having definite selective absorption for light

Photographic literature contains a great deal of information relative to filters There is one paper in particular, that by L A Jones—"Light Filters, Their Characteristics and Applications in Photography"—published in the Transactions of the Society of Motion Picture Engineers It is not the purpose of this paper to enter into a discussion of the theoretical aspects of light filtration It is intended as an announcement of new filter combinations which are now available and which were designed specifically for use with the new Eastman Super-sensitive Panchromatic Negative film for exterior photography

The filters which we are about to discuss are by name the "3N5" and the "5N5" filters We must consider of course in any filter work the sensitivity of the photographic emulsion with which they are to be used In this instance we are concerned with the sensitivity of the Super-sensitive film Details relative to the Eastman Super-sensitive film were outlined in detail in a paper by the authors presented at the last meeting of this Society in Hollywood This paper appears in the October, 1931, issue of the Journal That a clearer picture might be had of the sensitivity of this film as compared with the sensitivity of the film it more or less replaced, namely regular Type Two Panchromatic film, we show in Figure I, spectrograms of the two films just mentioned It will be observed that the Super-sensitive film shows greater green and red sensitivity when exposed to the same source, in this instance daylight, than does the Type Two

Figures II and III, show the spectrophotometric curves of the two filters in question These filters are combinations of certain yellow filter dyes with a definite density of a neutral gray filter The 3N5 is a combination of the Wratten Aero I plus a neutral density filter of approximately 50 (T 32%) The 5N5 filter is a combination of the Wratten Aero 2 plus a neutral density filter of 50

We should at this point make some mention of the use of neutral filters in practical cinematography There has been very little written on the use of neutral filters for this practical type of work One of the best articles on the subject is that by Joseph Dubray in the September, 1928, issue of the American Cinematographer Mr Dubray makes the following statements, "the exigencies of modern cinematography have brought about the use of a neutral gray light filter which serves to reduce the effect of the incident light upon the film without having recourse to either the reduction of the lens aperture or the reduction of the angular opening of the camera shutter In other words, by the use of these filters the exposure can be regulated at will by the cinematographer while maintaining the desired depth of focus and color rendition" This summary by Mr Dubray is, we believe, sufficient at the moment

As was previously stated, the two filters referred to, namely, the 3N5 and the 5N5, were designed for use in exterior photography There is nothing new about the Aero filters as such The point being featured at this time is the combination of these filters with the neutral dyes In the making of exterior motion picture scenes the cameraman rarely stops down the lens to the point where the depth of focus is approaching infinity Many exterior scenes are shot with apertures as wide as f 3 5 Naturally with an emulsion whose speed is as high as that of Super-sensitive, and as a matter of fact even with slower speed emulsions, such as Type Two, the cameramen felt it necessary to cut down the exposure on exterior shots without stopping down the lens The simplest way to accomplish this is to make use of neutral density filters As these are obtainable in various degrees of density (and naturally transmission) it is possible to obtain neutral density filters which would allow the cameraman to make exterior shots at whatever aperture he desired, which was usually fairly wide open and in the case of Type Two with a neutral density filter approximating 25 in density (56% T) With the increasing use of Super-sensitive film cameramen found that this neutral density was not sufficient and that it was necessary to cut down the exposure still more Attempts to promote stopping down lenses were unsuccessful in many cases so that the only alternative was to

(Continued on Page 22)

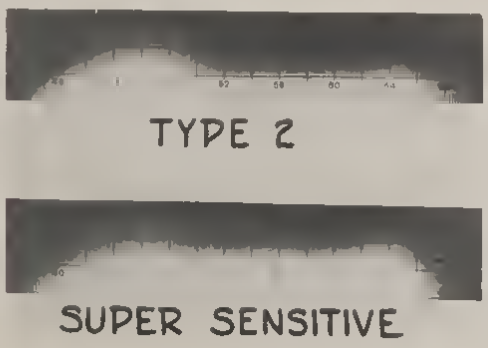


Fig. 1—Wedge spectrograms, daylight

Fig 2

The Measurement of Reverberation Time

by **F. L. HOPPER**
Electrical Research Products Inc Los Angeles

THE RECORDING and reproduction of sound pictures has brought many new engineering problems This is particularly true in the acoustical field, since the acoustical properties of the enclosures in which sound is recorded and reproduced, are of primary importance as an aid toward securing a faithful reproduction of the original sound Inasmuch as reverberation times is one of the criteria of the acoustic properties of an enclosure its determination is of primary importance as a step toward the solution of many of these problems

While in many cases reverberation time may be computed with considerable accuracy there are others in which measurement offers the only practical solution This may be due to the complexity or variety of absorbing materials present, or to a lack of data regarding their absorption characteristics Since absorption is a function of both panel vibration and porosity the manner in which the material is mounted has a marked influence upon its absorption Often it will be found difficult to secure complete absorption data for all frequencies

The disadvantages of the ear method are at once obvious Short reverberation times are impossible to measure with any degree of accuracy, a variable human element is introduced by the ear, multiple rates of decay cannot be detected by this method, and since such measurements depend upon the determination of minimal audiability, they can only be made when extraneous sounds are excluded

An electrical method in which the ear is replaced by a microphone, and some form of electrical timing device which may be operated by the sound after its intensity has decreased below a predetermined threshold, would be free from the limitations of the older method

Several types of apparatus for measuring reverberation time electrically have been described recently It is the purpose of this paper to describe one method which has been used in field work, and to give examples of the varying types of work which have been done with it

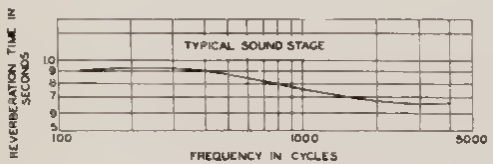


Fig. 1

The principle upon which the meter is based is simple A microphone converts the sound energy into an electrical current which is amplified and then used to operate an electrical timing device When the source of sound is cut off, the timing device begins to operate and continues until the sound intensity has decreased below some predetermined threshold value, at which moment it stops The elapsed time is then found from the timing device This device is designed to meet the following requirements It is small and readily portable It is capable of measuring reverberation times varying from about 0 3 of a second to 15 0 seconds It is arranged to measure the time required for the sound to decrease a maximum of 60 db in small progressive steps from 3 db up It can be used to make measurements in the presence of moderate amounts of noise and is sufficiently simple in operation so that measurements may be made with considerable rapidity

An approximate analogue for the decay of sound in a room is found in the discharge of a condenser through a resistance Since the time of decay may be readily computed from the circuit constants, such a circuit may serve as a check for the meter Several times of decay for various values of resistance were measured with this meter giving the following results

Computed Time from Circuit Constants	Time Measured By Meter
41	42
85	87
2 09	2 03
4 55	4 48

Problems to which the meter is applicable, and those for which it has actually been used, may be divided into two groups, acoustic problems related to recording or pickup, and those involved in the reproduction of speech or music In both groups we are interested in the determination and control of reverberation by suitable acoustic materials This of course necessitates the determination of the acoustic properties of the materials themselves, and is readily accomplished by chamber reverberation methods

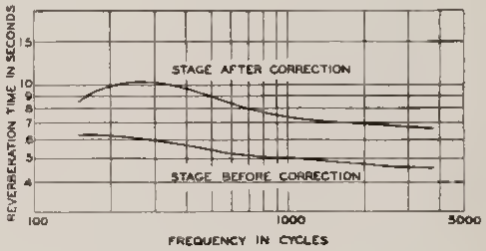


Fig 2

Included in group one are sound stages, sets, stages used for musical scoring and broadcasting studios In the second are theatres, review rooms, and auditoriums or music halls

Sound stages, in general, have been treated acoustically in an attempt to provide an approximation to outdoor conditions Materials having a large amount of absorption are used, and consequently the reverberation times are short The reverberation time frequency characteristics of a typical sound stage measured with this meter, are shown in Fig 1

Not only is the acoustic material in the stage effective in providing short reverberation times, but it also forms a part of the sound insulating structure which prevents extraneous sound from passing through the stage walls By the ear method the determination of the stage's properties would be difficult due to the short times involved

Stages used for musical scoring are frequently more live than some of those designed primarily for the recording of speech, because a certain amount of reverberation has been found to improve the recordings of music made in such stages The reverberation time is somewhat less for such a stage than would be the case were the room used for two ear listening Then too, the frequency reverberation characteristics are of considerable importance and can only be determined satisfactorily by measurement A scoring stage before and after acoustic correction is shown in Fig 2 A portion of the original

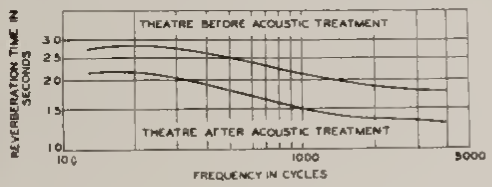
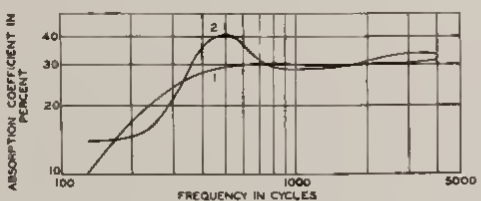


Fig 3

treatment was covered up with a material having less absorption, the resulting difference being clearly shown by the figure Recordings made under both conditions are considerably different, an appreciable improvement being noticed in records taken in the corrected stage

Since, as shown by Eyring,* it is possible to have more than one rate of sound decay in a room measurements will indicate the existence of such conditions, which might otherwise remain undiscovered Practically, the existence of two rates of decay is a detriment to good scoring, since the notes of higher pitch



CURVE 1 NORMAL ABSORPTION CHARACTERISTICS OF AN ACOUSTIC BUILDING BOARD

CURVE 2 ABSORPTION OF SAME MATERIAL SHOWING EFFECT OF PANEL VIBRATION

Fig 4

have too long a hangover, giving an unpleasant effect to the music This usually results from a lack of uniformity in acoustical treatment For example, the side and end walls may be less absorbent than the floor and ceiling, under which condition the low frequencies would be absorbed more rapidly due to the fact that they are less directional than those of higher frequencies Conditions, similar to those mentioned above for scoring stages are experienced in the case of direct pickup in the broadcasting of programs from studios

The acoustic correction of theatres from a purely commercial point of view is extremely worth while due to the increase in intelligibility and ease of listening Theatre patrons while perhaps not associating the improvement with acoustic treatment, recognize it, and consequently tend to patronize those theatres which afford the best listening conditions In the small theatre, the reverberation time may be computed satisfactorily In the larger theatres, or those in which a large amount of surface is exposed, the results of measurement and computation are often not in good agreement Consequently, in some cases it is advisable to base recommendations for acoustic treatment upon measurement Fig 3 shows the characteristics of a theatre as measured before and after acoustic treatment.

The electrical method of measurement is especially adaptable to the determination of absorption coefficients by the chamber reverberation method Shorter times may be measured, hence larger areas of material may be tested, giving a more average sample

It is especially important that the samples be mounted or applied in the same way in which they are to be used, since their absorption characteristics may depend upon several factors such as, porosity and panel vibration This is illustrated in Fig 4, which shows the absorption characteristics for a well known

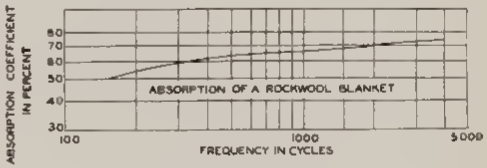


Fig 5

acoustic building board One curve shows the normal type of absorption in which no panel vibration is present while the second shows the absorption for the board mounted in such a way that it was free to vibrate as a panel While the difference between the two curves may not be entirely due to panel vibration, it serves to illustrate the point in question The necessity for measuring absorption coefficients under conditions of use and over a wide range of frequencies is apparent Fig 5, gives the absorption characteristics for a rock wool blanket having a high coefficient of absorption Materials of this type are used quite generally in sound stage construction

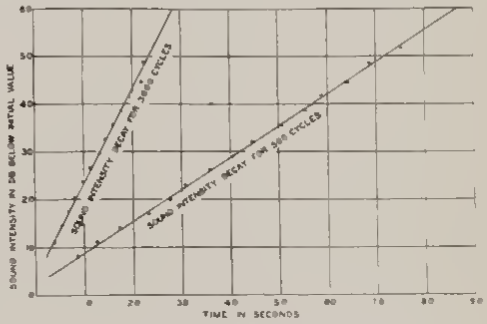

SOUND INTENSITY IN DB BELOW INITIAL VALUE
SOUND INTENSITY DECAY FOR 3500 CYCLES
SOUND INTENSITY DECAY FOR 500 CYCLES
TIME IN SECONDS

Fig 6

Fig 6, illustrates two typical sound intensity decay curves taken in an empty reverberation chamber These curves indicate the other extreme in reverberation times, which may be measured with this instrument.

The final degree of satisfaction obtained in listening to recorded or original speech or music depends, to a large extent, upon the control of reverberation This in turn requires the determination of optimum reverberation conditions and the provision of materials for obtaining them The usefulness of the reverberation time meter as an adjunct to these problems is obvious

* 'Conditions Under Which Residual Sound in Reverberant Rooms May Have More Than One Rate of Decay" Carl F Eyring Society of Motion Picture Engineers May 1930

Filters and Filter Factors

For Eastman Panchromatic Films

by **EMERY HUSE** and **GORDON A. CHAMBERS**
West Coast Division Motion Picture Film Department, Eastman Kodak Company

THE INTRODUCTION of Panchromatic films into the Motion Picture Industry necessitated a greater use of and demanded more knowledge regarding light filters The special information desired relative to filters was the simple term referred to as the "filter factor" It is the purpose of this article to fully define the term and present tables showing filter factors for Eastman Panchromatic films

It is more important to understand what a filter is, what it does, and why, than it is to know how much exposure is required when a filter is used To that end a brief discussion of filters is in order

Light filters could be called "light transmitters" or "light absorbers", but the word "filter" is applicable to both transmission and absorption in that it selectively filters out the undesirable light and transmits that which is desired

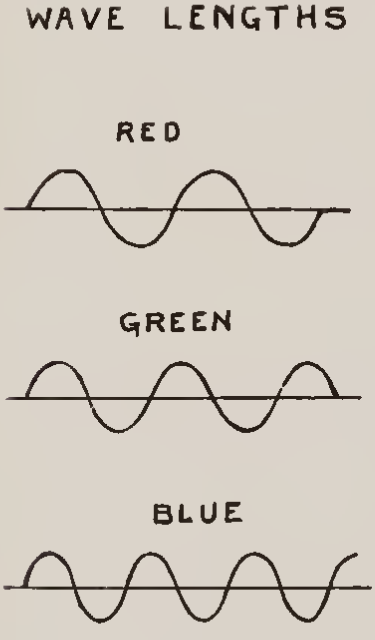


Fig 1

Filters are prepared from organic dyes which have been especially selected for this type of work They are made by coating gelatin containing a given weight of dye upon prepared glass, and after drying, stripping the gelatin film from the glass. Filters are supplied in the form of gelatin film as such or cemented between two pieces of optical glass

A greater understanding and appreciation of filters will be had with a greater knowledge of some of the facts concerning light In the present day motion picture practice two basic types of light sources are used, artificial and natural Under the artificial head comes those sources using tungsten (Mazda lamps) and those using carbons (flame arcs) The natural source of light is daylight, including sunlight The present day types of Panchromatic film, especially the Super-sensitive, are self-filtered and accommodate themselves to artificial light without the use of light filters, except in the case of color photography This is an intentional phenomenon inasmuch as the greater percentage of scenes "shot" in motion picture production are made under artificial sources of light The use of filters, therefore, is limited almost exclusively to exterior black and white photography. It is not desired to convey the impression that filters are absolutely necessary in exterior photography but their proper use greatly enhances the results It is interesting to know why this is true. The reason is bound up within certain physical facts contained under the general heading of light

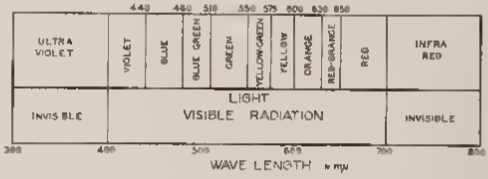


Fig 2

With the aid of a spectroscope, an instrument in which light is examined after being passed through a prism, light can be analyzed into its component parts If the original source of light was "white" the various colors composing it will be seen through the spectroscope merging into one another in a continuous band, but if the light is colored there will be breaks or absorptions in the band Filters produce this latter result and it is for this reason that white light looks colored when examined through a selectively absorbing filter Both daylight and tungsten can be considered white light in the general sense of the term in that they both show, upon spectroscopic examination, a continuous band of merging colors extending from the visible violet through the spectrum to the limit of the visible red However, although these two sources can be considered white light, they are not identical because their relative proportions of certain colors differ Daylight is considered white light in the broad sense of the word only

Just as in sound we have notes of different frequencies, i e, so many waves per second falling on the ear, so with light we have different frequencies of vibration falling on the eye Light is considered a wave form of motion in ether Since the velocity of light, 186,000 miles per second, is the same for waves of different frequencies, it is clear that waves of high frequency will be of shorter wave length than those of low frequency. Experiment will prove that the wave lengths of blue light are shorter than those of green light and that both are shorter than red light Figure 1 shows the relative length of the waves corresponding to the various colors, the diagram being drawn to scale Since there is a definite relationship

between wave length and color, a scale may be made in which the different wave length numbers correspond in position with the different colors in the spectrum A scale of this type is shown in Figure 2 The numbers representing wave length are expressed in terms of millimicrons (mμ) one mμ being equal to 0 000001 millimeter Figure 3 shows actual spectrograms made photographically of Eastman Type Two and Super-sensitive films expressed in terms similar to those described above These spectrograms show the relative sensitivity of these emulsions to various wave lengths

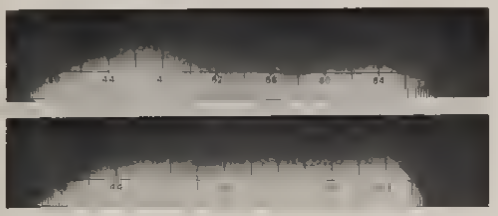


Fig 3—Upper, type 2, lower, supersensitive

Up to this point consideration has been given to light and wave length, and film sensitivity Filter transmission will now be discussed

In Figure 4 is presented what is termed the spectrophotometric curve of one of the Wratten light filters, No 58 This curve expresses the characteristics of the filter in similar form to that shown for the films in Figure 3 The coordinates of this filter curve are wave length and density (or transmission)

Density is defined as the common logarithm of $\frac{1}{T}$ where T = transmission, so that a density of 1 0 corresponds to a transmission of 10%, a density of 2.0 to a transmission of 1%, a density of 3.0 to a transmission of 1% etc

Referring to Figure 4, it will be seen that at wave length 520 this filter has a density of a little less than 0 3, which is the logarithm of 2 so that at this point the filter transmits rather more than one-half the incident light. At a wave length of 580 the filter has a density of 1 0 and therefore transmits 10% of the light at this point and also at the other side of its transmission curve at approximately a wave length of 490 Similarly the transmission drops to approximately 1% at wave lengths of 480 and 615 Transmission in the ultra violet beyond wave length 330 will be eliminated by glass in cemented filters and lenses, as glass absorbs ultra violet below this region With a knowledge of light emission, emulsion sensitivity, and filter transmission it is quite simple to determine the exposure (multiplying) factor of any filter for any emulsion for any source of light The data presented in this article pertain to the two Eastman Panchromatic films, daylight as the light source, and a series of practical filters The multiplying factor of a filter or the "filter factor," is defined as that factor by which an exposure without a filter must be increased when the same degree of exposure is desired from the same scene when photographed through a filter on the same emulsion For example, if a filter has a factor of 4, then to use it and obtain a properly balanced exposure it is necessary to increase the exposure normally given without a filter by that factor. Assume that the unfiltered condition is normal cranking speed, normal shutter opening, at a stop of f 8 in a standard motion picture camera The filter factor of 4, as previously mentioned, means that this stated exposure condition must be increased four times when using the filter The usual procedure is an adjustment of the lens stop allowing speed and shutter to remain constant

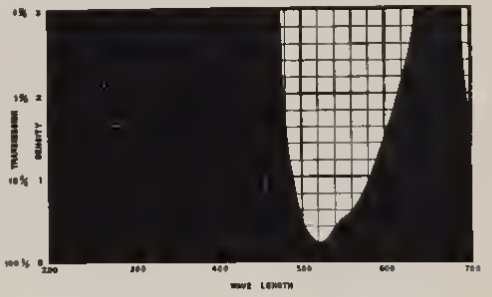


Fig 4

(Continued on Page 24)

	No Filter	Aero 1	Aero 2	3N5	5N5	12	G (15)	23A	A (25)	F (29)	ND 0.25	ND 0.50	ND 0.75	ND 1.00
	1.4													
	1.8	1.8									1.5			
	2.0	1.8	1.8			1.4					1.7			
	2.3	2.0	1.8			1.8	1.8	1.8	1.4		2.1	1.8		
	2.8	2.5	2.3	1.4		2.0	1.8	1.8	1.8		2.4	1.8		
	3.2	2.8	2.6	1.8	1.4	2.2	2.0	2.0	1.8		2.6	2.0	1.5	
	3.5	3.1	2.8	1.8	1.6	2.5	2.3	2.3	2.0	1.4	3.0	2.3	1.7	
	4.0	3.6	3.2	2.0	1.8	2.8	2.6	2.6	2.3	1.6	3.4	2.5	1.9	1.4
	4.5	4.0	3.7	2.3	2.0	3.5	3.2	3.2	2.8	2.0	4.2	3.2	2.3	1.8
	5.6	5.0	4.5	2.8	2.5	4.0	3.6	3.6	3.2	2.3	4.7	3.5	2.6	2.0
	6.3	5.6	5.2	3.2	2.8	5.0	4.6	4.6	4.0	2.8	6.0	4.5	3.4	2.5
	8.0	7.1	6.5	4.0	3.6	7.0	6.3	6.3	5.6	3.9	8.2	6.2	4.6	3.5
	11.0	9.8	9.0	5.6	4.9	7.9	7.2	7.2	6.3	4.4	9.3	7.1	5.3	4.0
	12.5	11.2	10.2	6.3	5.5	10.0	9.2	9.2	8.0	5.6	12.0	9.1	6.7	5.0
	16.0	14.3	13.0	8.0	7.2	14.0	12.5	12.5	11.0	7.8	16.5	12.5	9.3	7.0
	22.0	19.7	18.0	11.0	10.0									
Factor	1	1.25	1.5	4	5	2.5	3	3	4	8	1.8	3.1	5.6	10

N D = Neutral Density

Fig 5—Eastmen supersensitive panchrometic tilter expesure teble for deylight expressed in "f" values

HAL HALL

says

Thanks, Mr. Wilkerson

ONE of the most gratifying moves on the part of the various trade publications is the inauguration of a weekly page devoted to the motion picture cameramen in the Hollywood Daily Reporter Mr W R Wilkerson, able editor and publisher of that paper, is to be congratulated on this move

Too long have the journals and papers of the motion picture world neglected the cameramen; and it is really stimulating to see that they are now recognizing the importance and the metropolitan newspapers, too, recognizing the fact that the cameraman really is somebody in the picture world Harry Burns of the Hollywood Filmograph, Harrison Carroll of the Los Angeles Evening Herald, Edwin Schallert of the Los Angeles Times, and the reviewers on Variety and Film Daily and the Hollywood Herald have of late been doing their part, also, in giving the cameramen recognition, and this writer congratulates them for their attitude, and hopes that they will not only continue to give them credit, but will more and more see their importance and worth and increase the space in which they receive mention

There is no group of individuals in the motion picture industry who give more conscientious effort to their work than the cameramen Always thinking of improvement in quality of photography, these men spend hours of their own time studying ways and means to give the industry better results While some individuals in the picture world rush from the studio to appear in public places where their personal vanity may be swelled by public acclaim, the cameraman is usually found somewhere apart from all this trying to figure out a way to make a picture more pleasing to the eye

A word of mention, a pat on the back, a bit of deserved recognition now and then is but slight reward for intelligent and artistic effort Why not give it to these men who so often by their photographic ability turn what would be a failure into a picture that 'goes over''!

◆

The Cinematographic Annual

VOLUME TWO of the Cinematographic Annual is now off the press, and already we are feeling that happy glow that comes from words of praise It makes us particularly happy to discover that the motion picture world has really been anxiously waiting for this book to come from the press

We have tried to produce a book that would be an improvement over Volume One, and we hope and feel that we have succeeded, however that remains for the judgment of those who read it For those who love photographic beauty, we unhesitatingly urge you to get this volume, for it contains a pictorial section of 64 pictures which we feel should delight the eye of anyone who admires pictures.

Professional and amateur cinematographers will find a wealth of material for them Sound men will find that subject treated adequately Art directors and laboratory men and still photographers will find their field well represented, as will the projectionists and theatre executives In short we have tried to make the book as representative as possible in the motion picture field We hope you like it

Merry Christmas

AGAIN the Yuletide season rolls around, and we take this opportunity of wishing all our readers a Merry Christmas

To countless thousands this will not be a very merry Christmas, we fear, judging from reports that filter in from all parts of the world Jobless fathers anxious mothers, hungry children, pinched faces, aching hearts—that is what will be found on Christmas morning in thousands of homes where once the merry ring of happy, childish laughter peeled forth as the youngsters dashed to the Christmas tree to discover what Santa had brought them

Wouldn't it be the proper thing for all of us to select at least one of these families and see that there is a real Christmas in at least one home where unemployment and poverty plans to bring a present of unhappiness? Won't it make each of us happier—make the Christmas brighter—if we sit down to our Christmas dinner with the knowledge that we have made it possible for another family to forget—at least for the day—the hunger and want that is knocking at the door?

After all, what is Christmas? The birthday of the One who gave His life on the cross for others Wouldn't it be more in keeping with the day to deprive ourselves if necessary, in order to make others just a little bit happier?

◆

The Amateur Contest

TRULY remarkable is the interest among the amateurs in the $1000 00 Amateur Movie Making Contest now being conducted by this magazine Although the contest was started only a month ago entries have already been received from all parts of the United States, and letters of inquiry are coming in daily

This contest the rules of which appear on page 31 of this issue, is one of the biggest opportunities for recognition ever given the Home Movie maker And then, there is the first prize of $500 00 which should spur amateur clubs who wish to bolster up the treasury There are three other prizes of $250.00, $150 00 and $100 00 respectively This contest is strictly for the amateur, so no Home Movie Maker need fear that he will not have a chance and that a professional will get the prizes No professional is allowed to enter a picture If you are an amateur, we suggest that you turn to page 31 and read the rules Then enter this contest which is being sponsored by the American Society of Cinematographers

◆

Filters and Filter Factors

IN THIS issue of the Cinematographer will be found one of the most important articles that has appeared in connection with motion picture photography in years It is the article on Filters and Filter Factors For years cameramen have been asking for an exposure table such as accompanies this article Now, we are pleased to present this article and the exposure tables to them If any reader wishes a reprint of this article, it will be furnished at no charge if you will just write to the editor of this magazine

The Wave H. M. Armstrong

A Breaker on a Storm-Swept Shore H. M. Armstrong

Alfred L. Gilks, A S C

Alfred L. Gilks, A.S.C.

New Filters For Exteriors

(Continued from Page 13)

use neutral density filters of lower transmissions (increased density) or to cut the angular opening of the shutter. This latter feature has several undesirable aspects and therefore is not adopted. Inasmuch as the speed of the Super-sensitive film to daylight is approximately twice that of Type Two, it is very simple to adopt neutral filters whose transmissions are half those used for Type Two.

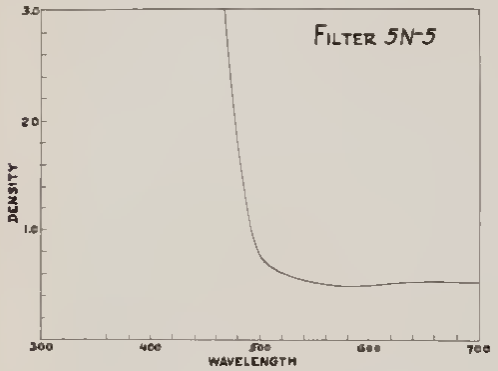


Fig. 3

The sensitivity of the Super-sensitive film when compared to Type Two is such that in effect the Super-sensitive film has approximately a K2 filter correction within itself. It will be observed from the spectra of these two emulsions that the basic difference in the spectral characteristics between Super-sensitive and Type Two is the increased proportion of red sensitivity of the Super-sensitive. Because of this fact, primarily the K series of filters up to and including the K2 have relatively little effect on Super-sensitive film, either from the standpoint of exposure or color correction. Experience has shown that the K3 and G filters normally produce over-corrected results on Type Two, but this is not true in the case of Super-sensitive film. With Super-sensitive it is desirable to have filter corrections of a lesser degree than the G or K3 filters give. To accomplish this we have tested several filters and it was found that the Aero filters produced these lesser correction effects quite satisfactorily and can be used as intermediates between the clear and the K3 or G corrections.

These Aero filters upon tests by various cameramen have proved to be extremely satisfactory but as was the case for either unfiltered or filtered shots, the neutral density filters were also used. It was because of the seeming necessity of using two filters that the Aero 1 and 2 filters were made each containing the neutral gray dyes so that both the correction and the decrease in exposure could be accomplished with the use of a single filter. A study of these filters to determine their exposure factor shows that for Type Two the 3N5 filter has a filter factor of 5, while the 5N5 has a filter factor of 8. For Super-sensitive film the 3N5 has a filter factor of 4, while the 5N5 has a filter factor of 5. It would be well to state at this point what a filter factor is. When a filter which absorbs some of the radiation to which the photographic material is sensitive is placed over the lens of the camera, it is evident that an increase either in exposure time, in the lens aperture, or in the illumination incident upon the object, must be made in order to obtain the same exposure on the negative as when no filter is used. The magnitude of the filter factor depends upon the conditions under which the filter is used and its determination involves a knowledge of the spectral sensitivity of the photographic material, the spectral distribution of energy in the radiation which illuminates the object, and the spectral absorption of all components of the optical system between the objects and the photographic material. The factors quoted previously take into consideration the sensitivity of the emulsion, the spectral distribution of daylight, and an average camera lens.

The method of applying the filter factors given above is very simple. Let us consider the case of 3N5 filter and Super-sensitive film. The factor given is 4. This means that it is necessary to increase the exposure normally given without the filter four times. From the standpoint of lens stop, if the unfiltered shot was made at an aperture of f 4 then the aperture should be increased to f 2 to take care of the filter factor. By a simple computation it can be readily seen that the amount of light passing through the stop f 2 is four times that passing through f 4. If the factor is 5, or any other figure, the aperture to accommodate the filter factor can be computed by the following simple formula

$$\frac{f}{FF} = f$$

where f = square of stop with no filter

f = square of stop with filter

FF = filter factor

For example, if as stated above the unfiltered shot was made at f 4 then $f = 16$; if the filter factor was 4 then $FF = 4$ the stop f at which to make the filtered shot is

$$\frac{f}{FF} = f \quad \text{or} \quad \frac{16}{4} = f$$

$$f = 4$$

$$f = 2$$

If the filter factor is 5 as would be the case when using the 5N5 filter, then by the above reasoning

$$\frac{16}{5} = f \quad \text{or} \quad f = 3.2 \text{ and } f = 1.8$$

Since these filters have been available only recently, no examples of their use may be cited. However, several cameramen are using these at the present time in current productions in Hollywood.

◆

The Challenge of Direct Color

(Continued from Page 11)

the special treatment referred to, would cause a somewhat weird effect. Other modifications such as burnishing, re-etching, stopping-out, etc. are resorted to in order to perfect the reproduction.

While a certain amount of control is necessary even with a perfect set of negatives, imagine the added labor and expense when the engraver has to supply some deficiency in "correction" caused by unbalanced camera filters, incorrect exposure or improper development! Certainly, it is up to the photographer to take every precaution in carrying out his end of the direct color process.

However, these last are all "back-stage" details which interest you but little. Your main concern is with the perfection of the finished product, its fidelity to life, according to your—not our—conceptions and at a price commensurate with the added effectiveness of "direct color."

NOT *too good to be true*

WHEN Eastman announced a new negative film two to three times as fast as previous emulsions, the news seemed almost too good to be true. However, Eastman *Gray-Backed* Super-sensitive Panchromatic Negative has lived up to every claim made for it . . . and more! It has brought benefits that no one could foresee. It has strengthened every link in the production chain. Naturally, it makes its greatest contribution to *the cameraman*. If you are not already using Eastman *Gray-Backed* Super-sensitive, get acquainted with it at once. Only by means of this ultra-fast, gray-backed negative can you bring your artistry to its fullest possible expression.

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J. E. Brulatour, Inc., Distributors

New York Chicago Hollywood

Bei Anfragen und Bestellungen beziehen Sie sich bitte auf den American Cinematographer

Fox Theater Assignments

RECENT personnel assignments among Fox theatres around the country include the following Richard Dixon has been appointed assistant manager of the Fox, Nemo, New York J Benjamin remains as manager. Louis Golden replaces Robert Cuzan as manager of Embassy, Los Angeles Paul Barry replaces Golden as manager of the Rosemary, Ocean Park, Calif. Robert C Cannom replaces J D L'Esperance as manager of the Orpheum, San Diego J D L'Esperance replaces George Christoffers as manager of the Egyptian, San Diego, and also replaces Franklin Elledge as manager of the Fairmount, San Diego Mel Todd has been appointed manager of the Fox Paramount, Cheyenne Wyo C E Miller is now manager of the Strand, Cheyenne, Wyo H B Ashton has been made manager of the Fox Paramount, North Platte, Neb Jack Burke has been made treasurer and Kenneth Henry assistant manager of the Park Plaza, New York

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New Reeves Catalogue

A NEW catalogue of unusual merit has just been issued by the Hollywood Motion Picture Equipment Co Ltd, of Hollywood The catalogue not only covers the various equipment thoroughly, but gives one of the best expositions of the fundamentals of sound that a practical man can find Mr Reeves, head of the company, is to be congratulated upon his very excellent piece of work

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Filter Factors

(Continued from Page 17)

To increase the aperture so that four times the amount of light gets through the lens means opening the lens to twice the aperture, which in this case would be f 4 Therefore, the same scene previously photographed unfiltered at f 8 can now be photographed with the filter whose factor is 4 by opening the lens to f 4 This reasoning of course is based upon the fact that the amount of light passing through the lens apertures varies as the square of the opening

Bearing in mind all of the above facts the filter factors of several filters were determined experimentally on the two Panchromatic films to daylight This was accomplished by sensitometric determinations on the two films under daylight quality of illumination for both filtered and unfiltered conditions The factors represent the ratio of speed between the two tests These sensitometric results were then applied practically in a camera and excellent agreement was found between the sensitometric and practical tests These filter factors were then expressed in terms of lens stops and computed into tabular form in the manner shown in Figures 5 and 6

It will be observed that these tables show the filters across the top, the filter factors across the bottom, while the extreme left hand column shows a series of arbitrarily chosen lens stops under the head "no filter" All values are expressed in terms of "f" values The use of the table is extremely simple Suppose a given scene is to be photographed on Super-sensitive film, both unfiltered and filtered Suppose the unfiltered stop to be f 5 6 Suppose further that the filtered exposure was to be made with the G filter Select in the first column under the heading "no filter" the value of f-5 6, project across the table in the line showing this value until the column headed G filter is reached At this point the value of f-3 2 is found Therefore, the scene shot unfiltered at f 5.6 can now be shot filtered with the G filter at f-3 2 and equally exposed negatives will be obtained, although the filtered scene will show a different relation between the sky and foreground, due to the selective absorption of the filter It must be borne in mind that the values listed in Figures 5 and 6 are very accurately determined Therefore, a lens stop nearest the value listed for any specific instance will undoubtedly answer in practical work The filters listed in the tables are those used to the greatest extent in straight photography, filters for night effects and other unique shots are not included, as their use is for distinctly different purposes, and for such filters balanced exposures are not desired

It would no doubt be of value if definite filters could be quoted as the ones to use in certain definite instances This cannot be done as conditions under which filter shots are made vary tremendously It is therefore necessary for the cameraman to size up the situation and act according to the dictates of his filter knowledge It must be remembered that to subdue a color a filter whose color is the complement of that to be subdued must be used, while to lighten a color a filter of the same color must be used, which filter fully transmits the desired color and subdues the others

It is hoped by the authors that the facts and data presented in this article will be of practical use to cameramen in motion picture production and make their use of filters easier and more effective

	No Filter	Aero 1	K 1	Aero 2	K 2	K 3	3N5	5N5	12	C (16)	25A	A (25)	ND 0.25	ND 0.50	ND 0.75	ND 1.00
	1.4															
	1.6												1.5			
	2.0	1.6	1.6										1.7			
	2.3	1.8	1.8	1.4									2.1	1.6		
	2.8	2.3	2.3	1.8	1.6	1.4							2.4	1.8		
	3.2	2.6	2.6	2.0	1.8	1.6	1.4		1.5	1.4			2.6	2.0	1.5	
	3.5	2.8	2.8	2.2	2.0	1.8	1.6		1.7	1.6	1.4		3.0	2.3	1.7	
	4.0	3.2	3.2	2.5	2.3	2.0	1.8	1.4	1.8	1.8	1.6		3.4	2.5	1.8	1.4
	4.5	3.7	3.7	2.8	2.6	2.3	2.0	1.6	2.1	2.0	1.8	1.4	3.8	2.8	2.0	1.6
	5.6	4.5	4.5	3.5	3.2	2.8	2.5	2.0	2.6	2.5	2.3	1.8	4.2	3.2	2.3	1.8
	6.3	5.2	5.2	4.0	3.6	3.2	2.8	2.2	3.0	2.8	2.6	2.0	4.7	3.5	2.6	2.0
	8.0	6.5	6.5	5.0	4.6	4.0	3.6	2.8	3.8	3.6	3.3	2.5	6.0	4.5	3.4	2.5
	11.0	9.0	9.0	7.0	6.3	5.6	4.8	3.6	5.2	4.8	4.5	3.5	8.2	6.2	4.6	3.5
	16.5	10.2	10.2	7.6	7.2	6.3	5.6	4.4	5.6	5.6	5.1	4.0	8.3	7.1	5.3	4.0
	16.0	13.0	13.0	10.0	9.2	8.0	7.2	5.6	7.5	7.2	6.5	5.0	12.0	9.1	6.7	5.0
	22.0	18.0	18.0	14.0	12.5	11.0	10.0	7.8	10.3	10.0	9.0	7.0	16.5	12.5	9.3	7.0
Factor	1	1.5	1.5	2.5	3	4	5	8	4.5	5	6	10	1.8	3.1	5.6	10

Fig. 5—Eastman type 2 panchromatic filter exposure table for daylight expressed in "f" values

"Always One Step Ahead"

Announcing . . .

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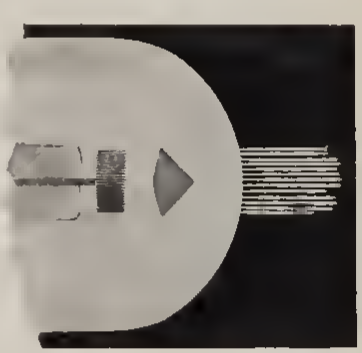
THE CATHODE is made wedge shape for optical purposes. It has a regular C. X. Base which is two inches long, protecting the lamp.



A complete new and improved Sound-on-Film Recording System with a new Recorder Optical Unit and an Amplifier with Automatic Volume Control

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MOTION PICTURE EQUIPMENT CO. LTD.
6416 SELMA AVE. CABLE ADDRESS ARTREEVES
HOLLYWOOD, CALIFORNIA, U.S.A.

Microscopic Films Show Blood Stream in Color

AIDED by powerful magnifying lenses and some exceptional microscopic cinematography Universal s "Strange as it Seems" reel is bringing to the screen a novel subject

By arrangement with S R Woodward biological cameraman, Nathan, Hahn and Fairbanks, sponsors of "Strange as it Seems" are presenting moving pictures in Multicolor of the blood stream in a frog's webbed foot Enlarging the transparent frog's foot for the first time audiences may see how blood flows through the veins, white and red corpuscles 1000 times their natural size on the film and enlarged nearly a million times on the average theatre screen

◆

Stokowski to Address S.M.P.E.

LEOPOLD STOKOWSKI director of the Philadelphia orchestra, will address the meeting of the New York Section of the Society of Motion Picture Engineers this month in the auditorium of the Engineers Building (33 West 39th Street) in connection with the first public demonstration of a new system of recording and reproducing music and voice

This new system, perfected by the Bell Telephone Laboratories is a development and elaboration of the "hill and dale" or vertical cut recording used by Thomas A Edison in his first phonograph The new system makes possible, it is said the reproduction of music as played by the largest orchestras with a quality and naturalness never before possible It will be explained and demonstrated by Mr H A Frederick of the Bell Laboratories

Music especially recorded for this demonstration will be reproduced by the new system using amplifiers greater in size than are used in even the largest motion picture theatres

Experience — merits Confidence

PRODUCERS have long since learned that this organization is qualified to meet their most exacting lighting requirements. . . Whether LACO incandescents, or BROWN-ASHCRAFT arcs — both indisputably superior products in the lighting equipment field — we are able, at a moment's notice, to supply your demands . . . . and our *experience* is *your* assurance of satisfaction.

CINEMA STUDIO SUPPLY
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HOLLYWOOD, CALIFORNIA

New Industrial Film Firm

BEN BLAKE, formerly in charge of production for Warner Bros Industrial Pictures and previously vice-president of the Stanley Advertising Co, has organized B K Blake Co to produce industrial and educational pictures The concern has contracted to handle productions for three important advertising agencies

9.5 MM. Talkies

A COMBINATION 9 5 mm, sound projector, screen, radio and phonograph, capable of supplying picture and sound to an audience of 300, has been put on the market by Pathegrams, subsidiary of Pathe Exchange Pathe features and shorts will be rented at one dollar a reel, including disc, for each 24 hours

40 From Monogram

MONOGRAM Pictures has set a tentative schedule of 40 features for next season, against 28 planned this season it is announced by W Ray Johnston, president Visiting exchanges in Los Angeles, San Francisco, Kansas City, St Louis, Chicago and Cleveland, Johnston says he found a big and growing demand for independent product

Talking Picture Shows Lamp Manufacture

MAZDA Lamps Preferred, the first talking motion picture showing the manufacture of Mazda Lamps had its premiere November 17 at the Euclid Theatre, East Cleveland, and has caused much favorable comment While quality manufacturing is the theme of the picture, with many "shots" depicting busy departments of the Nela Park research laboratories, a historical background is supplied by scenes showing Thomas A Edison and Francis Jehl, only surviving member of Edison s original laboratory assistants, re-creating the incandescent lamp at Dearborn on the night of Light's Golden Jubilee These views were taken at Henry Ford s replica of Menlo Park at Dearborn Mich

Screen Broadcasts In Technicolor

SCREEN Broadcasts of the Theatre Service Corporation, now exhibited in more than 3,000 theatres including virtually all of the Publix houses, will hereafter be produced in natural colors by the new Technicolor grainless process according to William Johnson President of Theatre Service Corporation

For sixteen years, Mr Johnson has been engaged in the business of screen advertising and his service has approximately 10,000 retail subscribers in 1400 cities covering 41 states

More than 250 subjects already have been filmed in Technicolor, Mr Johnson said, and will be released beginning about November 1 Each Screen Broadcast is fifty feet in length and not more than six are included on any program; being short and entertaining, with accompanying music, they are well received by the public They bring added revenue to the exhibitors

The contract for the Screen Broadcasts is the largest ever given to any color film company for advertising films

Hal Mohr, a Flyer

HAL MOHR, Hollywood cameraman and former president of the American Society of Cinematographers, is the latest film colony air enthusiast to receive his pilot s license Mohr got the license last month and in doing so established some sort of record as he received it just two months from the day he started taking lessons while all during that student period he was photographing productions at the RKO-Pathe studios The lessons came in the early mornings Billy Skall, one of Mohr's Assistant cameramen and a war flyer with a distinguished combat record, was the teacher

The flying cameraman has just been assigned to do Constance Bennett's new picture, "Lady With a Past". He photographed her last RKO-Pathe production, 'The Common Law'

..In the Realm of Sound..

Sound System For "Hamlet"

ANOTHER innovation for legitimate stage productions has been contributed by Electrical Research Products Inc , with the opening in New York of Norman Bel Geddes "Hamlet' at the Broadhurst Theatre Shakespeare's century-old lines have been enhanced by modern science in the form of music and sound effects coming from the loud speakers of a Western Electric Music Reproduction System

Special recordings have been made of a type similar to those used for electrical transcription programs broadcast over the radio Twin turn-tables, operating at 33⅓ revolutions per minute are so arranged that there is no pause in switching from one record to the next, and also provide for superimposing one sound effect upon another This superimposing facility is used to particularly marked advantage in the ghost scene, during which the weird sound of the wind at midnight continues through a brief musical selection which heralds the appearance of the ghost

The sound from the "phonograph records ' is reproduced through five loud speakers located at various positions backstage and controlled by a switching system which permits selective or simultaneous operation Thus in the mob scene by switching from one speaker to another in sequence the sound gives the illusion of a crowd surrounding and approaching the citadel, and the weak far-off, murmurs and cries develop to a great climax and loud cheers when the gate is finally broken down

The prelude, overture and entire musical accompaniment to the show is reproduced over the system—there being no orchestra or other conventional music used in connection with the play

The reviews and audience comments in Philadelphia where the Bel Geddes production had its try-out last week, were enthusiastic about the entertainment value contributed by the unusual music and sound effecs

"Hamlet" marks the fourth recent major stage production in which Western Electric sound equipment has been used The first was the "Miracle of Verdun," the Guild production where synchronized music and sound were used to heighten stage realism The George White 'Scandals" at the Apollo Theatre has a Public Address System installed to reinforce the voices of the actors and singers, thus making rear seats as desirable as the front row from a hearing standpoint In the new Earl Carroll Theatre where the "Vanities" is meeting with such success, a complete system of general reinforcement, including facilities for curtain call, announcements, manager's call system and reproduction of the stage program throughout the dressing rooms, is an important part of the theatre's equipment

The installation for 'Hamlet" was arranged by J J Way, Public Address Specialist, and H A De Palma, Supervising Engineer for Electrical Research Products

Photophone Distributing New Disc

WITH a market of approximately 4 000 theaters employing the disc method of sound reproduction, RCA Photophone has begun the distribution of a new type of d sc record which has been developed and perfected by the Engineers of the RCA Victor Co in Camden, N J

Known as the Victrolac Record, the important features claimed by the company which make it superior to the old style of shellac record are the reduction in size from 16 inches to 12 inches in diameter the pronounced reduction in weight from 24 ounces to four ounces, its flexibility and durability, improved tone quality and a minimum of surface noise

The company states that 90 per cent of the producers have arranged to record their product on this record

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Weston Corp. Develops New Photoelectric Cell

A NEW photoelectric cell, to be known as the Weston Photronic Cell and said to be different in construction utterly s mple and yet low in cost, has been announced by the Weston Electrical Instrument Corp of Newark N J

The new cell, it is declared, employs a highly light sensitive disc which transforms light energy directly into electrical energy without the use of any auxiliary voltage Its response to light variations is instantaneous and sufficient current is developed to operate directly Weston relays without the use of auxiliary apparatus or any battery It delivers about one microampere per foot candle of light intensity When exposed to direct sunlight the output is approximately 5 milliamperes The cell resistance from about 1,500 ohms for 10 foot-candles light intensity to about 300 ohms for 240 foot-candles intensity

Enclosed in a moulded black bakelite case 2¼ inches in diameter and one inch in thickness, the new cell is fitted at the bottom with two connection prongs which fit into the standard UX radio tube socket It is rugged in construction and is so simple in design that there is nothing to get out of order, the company claims

◆

Western Electric in Soldier's Home

TWO Western Electric Sound System installations will furnish talking picture entertainment for inmates of the National Military Home at Washington, D C_ as the result of contracts signed recently according to C W Bunn, General Sales Manager of Electrical Research Products One installation will be made in Stanley Hall and the other in the hospital building

EVERY SOUND ENGINEER SHOULD READ THE
CINEMATOGRAPHIC ANNUAL
The Greatest Authorities on the Subject have written on Sound in this book

Laboratory Department

Conducted by **EMERY HUSE, A. S. C.**

Principles of Sensitometry and Their Practical Application

Part 8

IN THE just preceding articles of this series the general subject of exposure was dealt with and included a definition of a sensitometer, followed by a detailed discussion of light sources The light source is the most essential element in exposure but a necessary adjunct to it is some device, mechanical or otherwise, which must be capable of producing a series of definitely known exposures Such devices are referred to by L A Jones as "exposure modulators"

The subject of exposure was dealt with in some detail in Part 4 and the general formula

$$E = I \times t$$

was fully defined It is evident from this definition that exposure is made up of two elements, either of which may be varied Exposure modulators, or sensitometers, may be classified then in terms of the manner in which the control of exposure is accomplished If the illumination, "I", is variable, "t" being constant, the resultant series of exposures is referred to as an **intensity scale** series If the time, "t", of exposure is variable, "I" remaining constant, a **time scale** series of exposures is obtained As a result of these two variables, sensitometers have naturally fallen into the two definite classes of intensity scale and time scale instruments

At the present time the motion picture industry makes use of both types of sensitometers, although the newer methods of control are making increasing use of the time scale type Before going into details regarding the practical methods of the motion picture industry it would be well to discuss at some length the evolution of sensitometers This discussion will be given in two sections based on the manner in which the exposure is made, one dealing with intensity scale methods and the other with time scale

INTENSITY SCALE INSTRUMENTS—Intensity scale instruments may be grouped into two separate classifications in that the variation of exposure from point to point may be continuous or discontinuous, thus giving after development of the exposed photographic material, a silver deposit which shows a continuous change in density or one which consists of a series of distinct steps Intensity scale instruments of this latter type are made use of in the motion picture laboratories to some extent and are usually referred to as "step tablets"

Probably one of the first of these intensity scale sensitometers consisted of "tablets" constructed in various ways These were made use of by placing them in contact with the photographic material to be tested in some suitable light tight box and exposed to a standard light source for a fixed time Probably one of the first sensitometer tablets used in the testing of photographic plates consisted of tablets made up by superposing an increasing number of layers of tissue paper in such a way that the illumination reaching the sensitive surface was controlled in an approximately known manner The various steps in these tablets were numbered in such a way that the number printed through By observing the highest number which would print through, the worker could, to a certain degree, test the speed of the photographic material which was being used. It can be seen, after consideration of present day methods, that this was an extremely crude procedure

L Warnerke used an intensity scale type of tablet which consisted of a plate glass approximately 3¼x4¼ in on the surface of which were located 25 squares increasing in density by supposedly equal increments These squares were formed by making a cast in gelatin from an original dye produced by superposing sheets of paper, the casting method being used that is known in photography as the Woodbury type The various areas were numbered consecutively by means of superposed opaque numbers The proportion of black pigment admixed

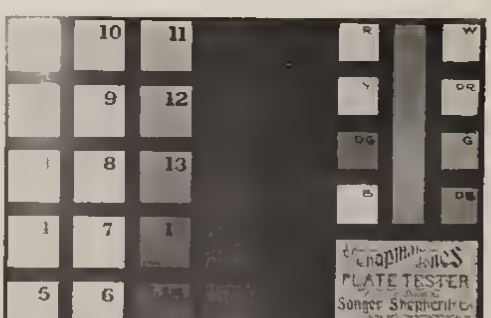


Fig 1.

in the gelatin was supposedly so adjusted that an increase of three numbers on the tablet represented a decrease of light intensity of 50% Tablets made according to this rule did not approach the ideal with anything like the desired precision

A later revival of the Warnerke tablet is found in the photographic plate tester of Chapman-Jones This tablet was made in a similar way, the square areas on the left hand side of the plate being neutral gray absorbers of different degrees of transparency, while the right hand side of the plate contained colored gelatin sections through which it was possible to get an approximate idea of the color sensitivity of the material tested However, tablets of this type could not be manufactured to agree with one another A single tablet used for testing could be considered quite good Figure 1 shows a sketch of a Chapman-Jones tablet

Tablets of a similar principle have been more recently devised but most tablets have the disadvantage of being difficult to repeat in manufacture In general this type of exposure mechanism is not very satisfactory owing to difficulties in reproducibility, permanency and precision in exposure gradient It is almost impossible to find a material which is sufficiently non-selective so that visual calibration of these tablets can be assumed to hold for photographic materials which are sensitive to an entirely different range of wave lengths than is the eye

R Luther suggested an ingenious device consisting of two neutral gray wedge tablets superposed with the axes of density gradient at right angles to each other Each neutral gray wedge is square so that the two fit over each other giving a square sensitometer tablet which modulates the intensity of exposure in two directions at right angles to each other When a photographic material which has been exposed behind this tablet is developed the dense area outlines approximately the D-log E characteristic curve of the material A sensitometer of this type has certain advantages where rapid means of testing

(Continued on Page 42)

What's What *in* Make-Up

In the November issue Mr. Max Factor, internationally known make-up expert, discussed the proper application of make-up. In this article Mr. Faeter takes up the basic principles of character make-up. —Editor's Note.

• Let us start by defining the word "character" as it applies to the acting profession. It is the representation of a particular personality, and impersonation, if you will, as interpreted by an actor. And he is a great actor only insofar as he creates in his audience that necessary "suspension of disbelief." He must look like an actor. He must look his part. And he does this by making a careful study of every phase of it. If the character he is to play is not vividly clear to him he will seek out authentic sources,—examine pictures, read descriptive material, and he may observe his model in real life . . . in the mines, the Ghetto, or wherever his problem takes him.

It is an erroneous notion that "any old way" will do in making up. The art of make-up is full of details, and to be slipshod about any of them may entirely affect the success of a performance. Good make-up creates an illusion, but there is no illusion about a poor make-up. No matter how far back you are from the camera, or how unimportant your part, it is not good business to try to fool your audience with poor make-up. True, the work calls for studied detail, but on the motion picture set there is nothing trivial about details.

High Lights and Shadows

In make-up this is an art that employs only light and shade, an arrangement or treatment of light and dark parts, to produce a harmonious and effective characterization. High lights are contrasting shades, skillfully blended with the foundation color of the complexion. Every dark line that is drawn on the face should be high lighted with a much lighter shade, and the edges must be properly blended with the complexion.

High lights are used to give prominence to the nose, cheeks, chin and wrinkles whenever it becomes necessary, in creating a particular character. To high light these features, use a lighter shade of make-up than the ground tone that is being used on the rest of the face. For ordinary high lighting use a shade three or four times lighter than the base. For extreme high lighting, use white or yellow lining colors. To make shadows or low lights use colorings of a darker shade than the ground tones of the complexion. In straight make-up shadows can be used to offset features that are out of pleasing proportion. In special character make-up, shadows are employed to produce sunken features by blending them with high lights.

To sink or hollow the cheeks and temples use shadows of gray or brown, high lighted with contrasting white or yellow, and blending the whole into the ground color. In most cases, in making low lights, do not use black. Use grey, maroon or dark brown.

The Nose

While there are significant differences in the proportions of the nose among different types of people, it might be helpful to know the general standard of proportions accepted by most sculptors and portrait painters, as follows:

1. The length of the nose must be equal to that of the forehead.

2. A front view of the nose should give the arch a little more width near the middle.

3. The point must be neither round nor fleshy. The lower contour, precisely outlined, neither narrow nor wide.

4. The flanks must be seen distinctly.

5. In the profile, the lower part of the nose should be only one-third its length.

6. The sides of the nose form a wall.

When these proportions are required the use of high lights and shadows will give the effect. To make the nose thinner and more prominent use a high light on the bridge of the nose of a much lighter shade than the ground color of the complexion, carefully blending the sides with gray shadow or red brown.

To tilt the nose upward use brown shadow in a triangular shape underneath between the nostrils.

The Eyes

In the eyes we can read many human emotions—sadness, hope, fear, defiance, anger, wistfulness, contemplation. Further, the characteristics of the eyes—the shape, color, setting, eyebrows—indicate types of personality. The eyes can be made to appear offensive or unfriendly if they are set too near or far apart. The arrangement of the eyebrows should be in accordance with the desired effect.

Sunken eyes may give a threatening or sombre look, depending on how the sunken effect is treated with relation to the other features of the face. To make the eyes appear larger draw a line with the dermatograph pencil around the upper and lower lids. This line must be drawn a reasonable distance from the lash lines, allowing the skin to be visible. The effect is best achieved at the outer corner of the eyes.

The Mouth

The mouth may be called the most sympathetic part of the face. Its mobility makes it readily responsive to our innermost feelings, indeed, the mouth sometimes betrays our deepest thoughts. With the eye it makes up a language that is unmistakably communicated.

In making up the feminine lips the width and the cupid's bow should be in pleasing proportion to the other features. To achieve this, sometimes the natural lip lines may have to be concealed. This is done by applying lip rouge, forming the desired shape and size, then carefully spreading the ground color with a tinting brush to the edges of the new lip line. To hide line of demarcation or impression of such, pat the complete surface of the concealed line with the index finger.

Men, in applying lip rouge, must avoid the appearance of a cupid's bow. Strange to say, this is often overlooked. If one lip is more prominent than the other, use two shades. A dark shade to subdue the prominent lip and a bright shade to accentuate the other.

A jovial, good-natured expression is effected by tilting the ends of the mouth upward. A worried, haggard, painful expression is made by drooping the ends of the mouth.

◆

Minneapolis Pantages Becomes United Artists

UNITED ARTISTS has taken over the Pantages, Minneapolis loop house that has been vacant for some time. House will be called the United Artists and W. H. Rudolph of New York is manager. Austin McGough, division exploitation manager, aided in the deal.

Bell & Howell Builds in Hollywood

• ONE OF THE MOST attractive buildings in Hollywood is the new Hollywood home of the Bell & Howell Company at 716 North La Brea Avenue. The building is the last word in completeness of equipment and quiet beauty of design and furnishings.

The spacious reception room in the new Bell & Howell Hollywood plant

It is sincerely hoped by Bell & Howell officials that both amateurs and those engaged in the various divisions of the professional motion picture industry will take full advantage of the really fine facilities offered at 716 North La Brea Avenue. The eighty-seat theater and its projection booth will be fully equipped for showing sound or silent 16 mm or 35 mm films, and will be at the disposal of Bell & Howell customers and friends, as will the three smaller projection rooms and the room which is fully equipped for 16 mm. film editing. Among others, Filmo using travelers visiting the film producing center will find these facilities most welcome.

Both professional and personal motion picture equipment will be displayed and serviced in this building. An engineering department, thoroughly supplied with every necessary instrument, will operate as a branch of the famous Bell & Howell research, experimental and engineering department at Chicago which, incidentally, has just had its quarters enlarged approximately 50%. A most modern motion picture machine shop will provide for servicing 16 mm. and 35 mm. equipment and for building special cine machinery. Lens testing, setting and repairing will be taken care of by a fully equipped optical department.

All in all, the new building, together with its equipment and personnel, will permit Bell & Howell's Hollywood branch to render the highest type of service in both amateur and professional motion picture fields.

YOUR OPPORTUNITY!

The AMERICAN CINEMATOGRAPHER now offers the greatest opportunity ever given the AMATEUR MOVIE MAKER to win recognition and cash. ¶ A total of **$1,000.00** in **CASH** prizes is offered by this magazine to the winners of the Amateur Movie Making Contest announced in the October issue. This contest is sponsored by the American Society of Cinematographers, an organization composed of the world's leading professional motion picture cameramen. If you want to win recognition, as well as cash, read the rules below and send your entry :: :: :: :: :: ::

COMPLETE RULES OF THE AMATEUR MOVIE MAKING CONTEST

The American Cinematographer will present a prize of $500 00 for what its judges consider the best 16 millimeter picture submitted in this contest $250 00 will be given as second prize, $150 00 as third prize, and $100 00 as fourth prize, a total of $1000.00 in prizes

This contest is open ONLY to AMATEURS No professional cinematographer will be eligible to compete It is a contest solely for the amateur, either the individual or the club

The contest officially opens November 1, 1931 The contest ends at midnight of October 31, 1932 All pictures must be entered by the closing date or they will not be considered Entries mailed or expressed bearing the date of sending will be accepted if they reach THE AMERICAN CINEMATOGRAPHER office after October 31, 1932, providing the date shows they were sent before midnight of October 31, 1932.

Pictures submitted in this contest will be judged upon photography, composition, direction, acting, cutting and entertainment value And only silent pictures will be eligible for the contest The judges, whose names will be announced later, will include outstanding and widely known Cameramen, Directors, Actors, Writers and a group of nationally known Motion Picture critics from some of the best known newspapers in America

The decision of the judges will be absolutely final, and there can be no appeal from their decision Announcement of the awards will be made as soon after the close of the contest as possible and checks will be mailed the winners

Pictures may be submitted either by individual amateur movie makers, or they may be submitted by Amateur Movie Clubs However, they MUST BE photographed on 16 millimeter or 9 millimeter film Accompanying each entry must be a sworn statement to the effect that no professional cinematographer assisted in the making of the picture No pictures will be accepted which were photographed on 35 millimeter film and then reduced to 16 millimeter

This contest is open to amateurs and amateur clubs anywhere in the world with the following conditions

Only Bona Fide Subscribers to the American Cinematographer Can Compete

If you are a paid-up subscriber to THE AMERICAN CINEMATOGRAPHER you are eligible to enter the contest If you are not a subscriber just send in your check for a year's subscription and you are eligible

In the case of Amateur Clubs the following rules apply

If a club with a membership of 20 or less wishes to enter a picture, the club will have to have a minimum of 5 subscribers among its members Any club with more than 20 members will have to have a minimum of 10 subscribers among its members For any further information you may desire, write the Editor of the American Cinematographer, 1222 Guaranty Building, Hollywood, Calif., or consult your photographic supply dealer

IF YOU WISH TO ENTER THIS CONTEST AND ARE NOT A SUBSCRIBER MAIL COUPON TODAY

American Cinematographer, 1222 Guaranty Bldg , Hollywood, Calif

Enclosed please find Check, or Money Order, for $3.00 ($4.00 foreign) for which kindly enter my subscription to THE AMERICAN CINEMATOGRAPHER for one year.

Name

Address

It is understood that this subscription makes me eligible to enter your $1000 00 Amateur Movie Contest

Amateur Movie Making

by **HATTO TAPPENBECK, A. S. C.**

THE FUNDAMENTALS of photography are the same in still work as in motion pictures The theory of these underlying principles can be obtained from the many books written on photography and its art The manipulation of the camera, whether it be for stills or movies, is quite readily acquired from the pamphlets and instructions furnished at the time of its purchase

The more practice with the camera, the easier the handling will be and the better the results But the taking of the picture is only one step towards the finished product Many times the photographer is dissatisfied with the result of his efforts The subject was there, the camera was handled right but the picture or film is a disappointment On the other hand sometimes we take a "shot" at a subject, just for remembrance sake or for a mere record of the locale or object, and in spite of our more or less indifference in handling the camera we get the surprise of a perfect picture

This shows what great possibilities there are in photography and cinematography, if we know how to tackle them And this is only possible by a thorough practical knowledge of ALL the phases our film and prints go through from the time we take the picture until we have the finished print This necessary knowledge CANNOT be acquired out of books, but must be learned by practical experience in the darkroom

I am not actually advising every 16 mm enthusiast to go ahead and build a darkroom, install machinery, and process his own 16 mm films On the contrary, there is too much expense and work connected with the development of the long strips of film as to try to handle them at home

However, I mentioned before that the fundamental principles involved are identically the same for motion picture and still photography Therefore we may apply the problems arising in the one to the other, and vice versa There are countless ways in which still photography will improve the motion picture work in addition to providing a good pastime as well as an interesting study A small, convenient darkroom may be installed and equipped at very little expense and will pay well for the time spent there

The ideal still camera for such an enterprize is one which takes the standard motion picture film, thus enabling one to experiment with the fast emulsions now used in the movie camera The expense of film is negligible even if a large number of pictures is taken This gives the opportunity to photograph the same scene several times with different exposures, stops, or filters A comparison of the negatives with each other and the corresponding notes taken at the time of making the shots will disclose valuable data for future use

In most cases the film nowadays has enough latitude to give a printable picture at any halfway normal exposure But there is only ONE correct exposure for certain results wanted, be it soft and diffused or contrasty and sharp The real value of such tests lies in the possibilities of getting effects. A good picture requires a certain mood, a certain effect to express truly what it is meant to portray. Oftentimes a filter of some kind will add this final touch, which makes the picture an outstanding one, different from the others, more pleasing

It is quite possible to make or buy a set of filters and to provide a suitable filterholder which will adapt the one set to both, still and movie cameras With the aid of a good photometer or a little computation the identical results from the still may be secured on the movie film

Still photography and the printing of stills give valuable hints on exposure and development which can change the whole character of the picture from a merely commercial product to a work of art If you do your own developing, etc., you will find that the close contact with the picture throughout all phases from its conception up to its finish gives a more powerful and lasting impression as to its merits and faults

The chemistry is an interesting part of photography in itself Besides that it helps materially to define the condition and the treatment of the negative and print Good results as well as faulty ones are often due to the laboratory work But in quite a number of cases too much is expected from the cameras and film material we have to work with They have their limitations too with which we can get acquainted only by actual trial and experience, and with which no laboratory is able to cope, once the exposure is at fault

Ordinarily one has very few chances to know the working methods of the laboratory where the 16 mm film is being processed A still taken at the same time, speed, stop, with the same emulsion, etc , does much to reveal the film's development and requirements in the way of a perfect exposure A close comparison of the still negative with that returned from the laboratory may lead to great improvements in the quality of the 16 mm film

Last but not least the making of still prints will contribute to the rapid development of a sense for composition As the smaller contact prints do not lend themselves so readily for judging the same, it is advisable to enlarge them In projecting our 16 mm film we do the identical thing, we enlarge the image incidentally producing better detail and gradations in the shadows

A good small enlarger creates not such a problem anymore as it did a few years ago There are many suitable and inexpensive makes to be had In enlarging the picture one may already try for composition by using only part of the original negative After all, composition is nothing else but a pleasant arrangement of the photographic matter In the camera we have the means of telling a story We can make it a good or a bad one from an artistic viewpoint according to the composition which may be pleasing through its harmony or distracting through the shattered disarrangement of the whole

Of course, the proportion is fixed for the 16 mm film Its actual picture dimensions 8x10 5 mm. give nearly a 3x4 proportion which is very agreeable to look at on the screen It should not be difficult to arrange a good composition for it Oftentimes an interesting action makes us overlook the environments, but that does not mean that in such a case good composition was unnecessary How much more pleasing would the whole picture have been, had the acting been laid in a more fitting place, or if the background itself had been well chosen? It would have helped to direct the thoughts towards the action rather than to avert them by too great a contrast between the principal subject to be photographed and its immediate surroundings

This should be particularly observed in close-ups where a too prominent background can be very distracting Special attention has to be paid to lighting the close-ups in the film The study of stills made from different poses of the subject will indicate the vital points of the motion picture lighting We are dealing in reality with a series of successive portraits Therefore the light should be so arranged that the person in

(Continued on Page 42)

A Filmo for Christmas

...the gift that is worthy of the spirit behind it

Life size, theater clear theater brilliant home movies are shown with the new Filmo Model "J" Projector

FOR photography-minded people, there is little question about the movie camera or projector to give for Christmas Filmo, of course, is the choice of those who know

And why? First, you have the simplicity of taking movies for which the Filmo Camera is famous *"What you see, you get"* down to the last detail, with the clarity and the brilliance and superb photography you would expect only from a professional movie camera And it's only natural that Filmo give movies of professional quality, because it is made by the same master craftsmen who make the internationally famous Bell & Howell Studio cameras used by the major film producers of the world

And when Filmo movies flash on the screen there you see the undeniable proof of the superiority of the Filmo Projector—movies so brilliant and clear that you miss not the tiniest detail, movies steady and flickerless

Can you think of a better gift than personal movies, or better equipment to take and show these movies than Filmo? Do not be misled by price tags Bell & Howell equipment is in no sense expensive, for it is built not only to produce the finest of personal movies but to last forever *No Filmo has ever worn out!*

Go to your dealer's today Ask him to demonstrate Filmo for you, or write us, if you like, for interesting Filmo literature

Bell & Howell FILMO

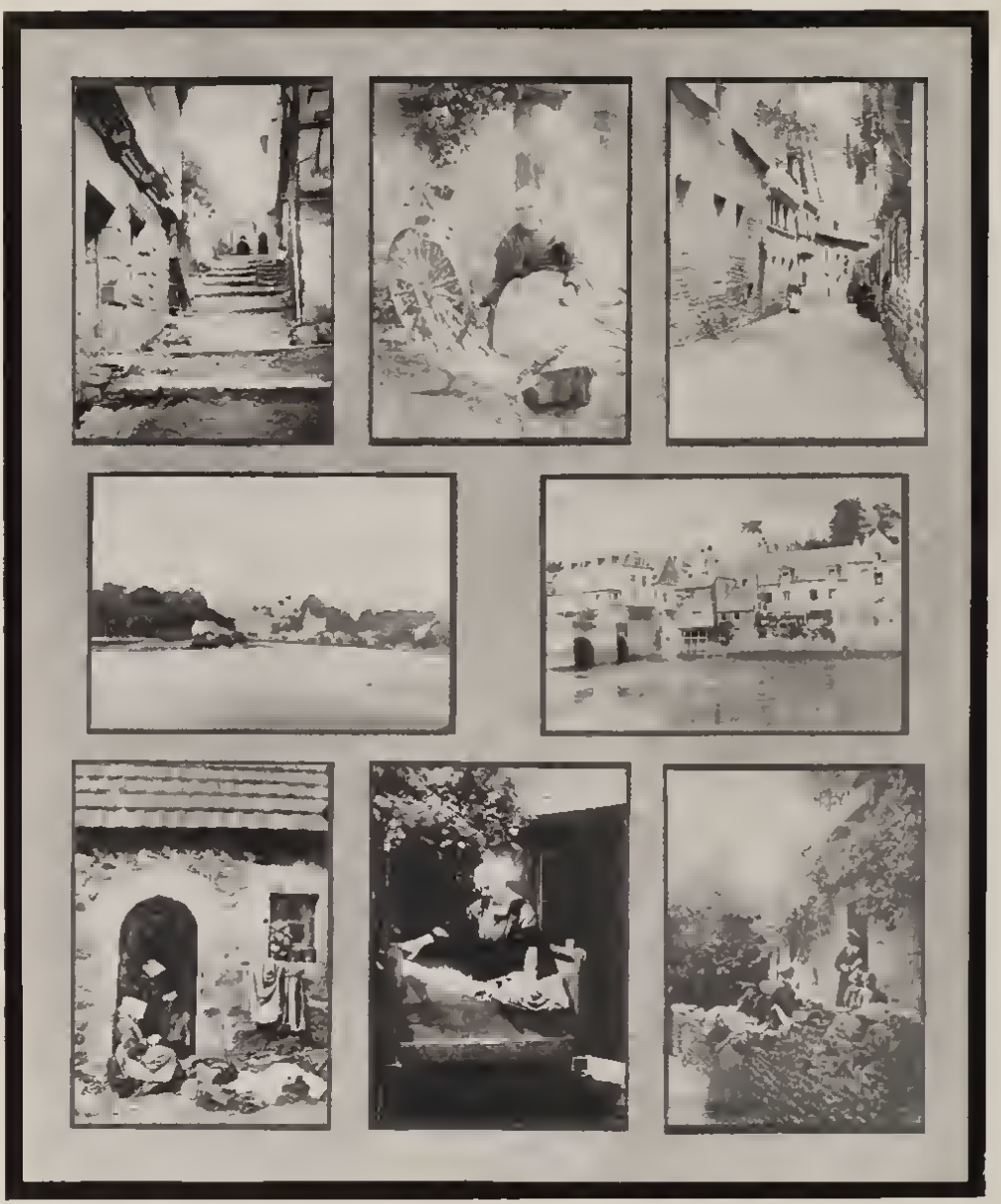
BELL & HOWELL COMPANY, 1848 Larchmont Avenue, Chicago, Illinois
New York, Hollywood, London (B & H Co., Ltd.) *Established 1907*

The new model J projector

This is the new 1000 c gear drive Filmo Model J Projector It is automatic threads your picture in a new and powerful optical system that gives 50 more light than ever with automatic pilot light that makes threading so easy a new tilting device, illuminated voltmeter, radio interference eliminator and other refinements that make it the outstanding advance in 16 mm movies Price complete in these $297 fully equipped for Kodacolor as well as black and white $337

The Filmo 70-D Camera

Below is the Filmo 70 D Camera still the undisputed master of all personal movie cameras It has a three lens turret head enabling you to switch from one lens to another in an instant Its series film speed gives you the slowest of slow movies and the fastest too Its variable view finder automatically frames your picture regardless of the focal length of the lens Prices $245 and up with Mayfair Case Other Filmo Cameras from $92 and up The Filmo 75 Field Model Camera equipped with Kodacolor filters and speed lens at $149 50 is the lowest priced Kodacolor equipped movie camera you can buy



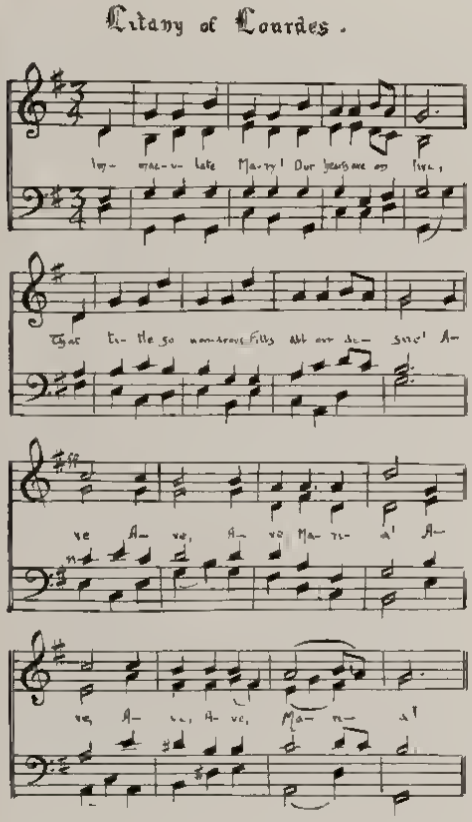
1 and 3 Streets in Auray 2 A "rouet a filer" 4 Auray from the estuary 5 Auray bridge. 6 The oldest. 7 The youngest 8. The most prolific

Babbling About Brittany

by **LAWRENCE GRANT**

This is the ninth and concluding article of this unusually interesting series which Mr Grant has written for this magazine—Editor's Note

THE HYMN of the Brittany Peasants Pilgrimage to the Grotto of Our Lady of Lourdes, where the little shepherdess Bernadette Soubirous saw the vision of the Virgin Mary, a hymn which is now used at every "pardon" in Brittany, as well as in Catholic churches the world over, epitomizes Brittany and the Breton character more clearly, more completely and more perfectly than any written page can do, even though Anatole le Braz who knew more about the Bretons and their country than anyone else, were the writer



They are saturated, in the full dictionary meaning of the word, which is,—as much as can possibly be absorbed—with religion, and with tradition.

But like the Litany their faith is not flat, nor their religion dull It has an aesthetic quality, this faith of theirs, it has a poetic imagery and a musical lilt to it, this devotion which sways them all so strongly, young and old, grave and gay

That's it Gay They may say themselves that they are Bretons first and French afterwards, but they have a gaiety, a resilience, a charm, and a good humor that proves them unmistakeably French They laugh

"One touch of nature makes the whole world kin"

But

'One touch of **humor** makes the whole world **kind**"

Laughter is the gift of the Gods He who can laugh or respond freely to another's laugh is full of riches

It is a child's most endearing attribute

"If the golden crested wren
Were a nightingale—why, then,
Something seen and heard of men
Might be half as sweet as when
Laughs a child of seven"

As a matter of fact it was laughter that gained for me the privilege of making a motion picture, for the first time in history, of Pontifical High Mass

It was at this the most famous of all "Pardons" of St Anne d'Auray, which takes place 25th and 26th July each year I went over from Auray on the 23rd to select such spots as seemed suitable for cameras, etc and to get other advance information I found a Priest decorating the altar of the outdoor church, but from him I got no information, scarcely courtesy, and when I mentioned a camera he became absolutely morose I went further and found the Father Superior a delightful person, wearing as he came out of his house his long black priest's cassock, but on his head a soldier's red peaked cap! This was the first time I have ever encountered such a combination, though at Quimper Cathedral I had seen a priest kneeling before an altar with spurs sticking out of his shoes, his uniform being under his church robes! You see this war was the first time that priests had been made combatants

This priest-soldier was delighted to give me all information about the services and where they would take place, but when he found I had a "cinema" with me, he too changed his attitude It was impossible There were to be three Bishops for the celebrations of all the services, and the Archbishop of Nantes, Monseigneur du Parc, objected strongly to any religious ceremony being shown on the cinema

"Could I meet him?" "Certainly, tomorrow he would be here"

I met him, I talked to him, I explained to him that I was to take these pictures back to America where I hoped many Catholics would see them and observe how beautifully the various ceremonies were conducted in this old world fashion I told him how little of the old there was in the States, with the exception of a few missions in California, everything new New Cathedrals, new vestments, new architecture, and, with a smile I added, "I even suspect some of the relics as being new" He was a delightful old man, and he laughed at this, and I thought if you laugh you are beaten In the end I stayed to lunch, he himself came out to show me where and how he thought I should place my cinema, and after the procession had passed he told me that if I was quick I could pick it up again at another spot where he and the other Bishops would give the benediction in front of the lens in a close up. All this I subsequently got Alas, only in "movie" Then said he "You may take some feet of the Mass provided you give me your word of honor that you will not photograph such portions of it

as you know I would not wish you to record" And with promise I not only obtained permission, but I found he knew that a telescopic lens would be needed to go over the heads of the crowd and he himself came and discussed this as well

These pardons" of Brittany are hard to describe, at least exactly why that name has been attached to them It would seem originally that in addition to the usual weekly or monthly confession and absolution, this yearly gathering was in the nature of a grand confessing and pardoning which should clean up the whole past year

Even cattle were absolved from their misdeeds in the old days, and blessed for the future Today they are still brought in to many pardons and blessed, noticeably at the pardon of Our Lady of Light at Baud, and a certain percentage of their increase during the year is turned into the Church in return for this received blessing

Among so much that is lovely, picturesque and full of genuine and beautiful devotion it is upsetting to find so much that is sordid and commercial At every pardon this crude commercial element enters Here, at Auray, round the entire enclosure of the great Basilique are the boutiques" selling wax candles and rosaries, and images, and sometimes other more secular articles which are supposed to add to the gaiety of any celebration, just as we have trumpets and teasers for New Year's Eve But it jars with this atmosphere

I remember being horrified at Lourdes in the Pyrenees They had adapted electricity to religious statuettes, by placing a small light bulb **inside** the figure which was of semi-transparent milky china And in various small shops which line the main street you read — 'Buy our transparent Virgins, the only genuine"

So I find all this commercialism very annoying, and cannot help wondering whether the Great Founder of their Faith would not do a little modern scourging from the Temple of this kind of people if He came back among them

But the spirit and the devotion and the faith and the picturesque appreciation which every peasant seems to have, rises triumphant over all that is tawdry and modern and cheap and hideous It even is oblivious of the hideous modern architecture of the Basilique, which is frightful Dear old 'Guide Joanne" says — "La basilique, reconstruite de 1866 a 1873, est un grand monument en **pseudo-style** de la Renaissance, et **d'un art mediocre**."

However, all is well, for on the other side of a narrow street is a delightful oblong garden, perhaps 100 yards long, with an altar built high up above all heads, and approached by a stair case on either side, the 'Scala Sancta," and here unless the weather is unfavorable all the principal ceremonies take place during the two day pardon

The "Scala Sancta" has other uses besides that of permiting the access to the altar space by Priests and choir On these steps you may expiate your offences for the past year To do this you must start **on your knees** at the bottom step, and praying as you go, go all the way up and all the way down still on your knees! And if you are not thereby forgiven for what you have done, you will at least carry the memory of your penance for some time as a restraining influence against future offence

To this, one of the great pardons, (another is St Anne de la Palude) peasants will come from all over Brittany, and you will probably see more varieties of caps in a single day than on any other occasion, and during the afternoon, after the ceremonies, will be gathered the most beguiling groups here and there all over the grass of this outdoor church with their picnic lunch, **with wine**, for without wine no meal would be the slightest good in France, other groups round the great fountain, and others round the front of the little Inns and restaurants, and all with such gaiety, such simple gaiety and such delightful bonhomie as I have never encountered among any other people Especially the women and the girls It seems to you that I have harped on the female of the species in these chapters, but I am not influenced by the charm of the youth or the beauty of them though such there is aplenty, but by their ability and the qualities of capability During the war they were France's props and bulwarks and now since the war they are France's hope, for to them they must look, mustn't they for the future generation of babies that have been coming on since 1918 The hand may have forgotten how to rock the cradle elsewhere, but the peasants of France, where they have for years been wise enough to see that the cradle does not get over crowded or over used, at least can rock that cradle efficiently and instil their own good qualities into the little minds of the little bodies they are rocking

The great processions at these ceremonies are really splendid, with the vivid scarlet cassocks of the choir boys, the gorgeous copes and dalmatics of the Priests, the marvelous colors of the embroidered banners, the golden treasures from the church, the statues, always colored and sometimes, as here at St Anne, of pure gold leaf, together with the caps and the gay costumes of the crowd make an impression on the eye never to quite forgotten

But again all this would make but a passing impression, if it were not for the surrounding atmosphere of sincerity and gay good humor

Perhaps character is much affected by climate and living conditions, for about the only people who are less gay than usual are those who come from the Ile de Sein where the climate is fearful, and which is isolated from the main land for considerable times owing to weather conditions making it impossible for any one to approach the island

Here is a place where character and even appearance is not affected solely by climate, but also by surroundings and superstitions and traditions

The Ile de Sein has been mysterious at one time, evil at another, and wild and barren, and rocky and rough all the time

In the days of the Cromlechs and the Menhirs it was an important Druid gathering place There lived Teutates, a wild sorcerer with nine sacred Druid Virgins, who, for those who had the courage to cross the tempestuous waters from the mainland to visit them, would give divinations and foretell their futures It was a burying place for Druid Priests who were brought from the mainland to their last resting place through the Baie des Trepasses, (the Bay of Those Who Have Passed On) and according to Breton tradition the souls of shipwrecked sailors still haunt its barren lands at night, knocking and crying at the cottage doors till their bones shall all be found on the shore, and demanding burial for them

No wonder the islanders were thus haunted, for in later years no sooner had the fear and superstitions of dead Druids begun to die down, than certain fisher people from the mainland made their homes on the shores, ostensibly for fishing but in reality they found a far more profitable, though villainous way of making a living They became "wreckers" by profession The wind and sea, rough and dangerous as they were, did not bring in a sufficient number of wrecks to satisfy their greed, so they would tie torches on the heads of cattle and let the cattle run wild about the island at night, thus luring vessels already in trouble in the fogs and heavy seas, to their destruction on the rocky shore

Today fish is plentiful and fishing is their means of livelihood, but still the coast is so dangerous that gathering wrecked loot from the shore which is sold by auction legally in the little town adds considerably to their small incomes

Whatever they get is obtained at a price few would care to pay. The climate is abominable, the sea rough the rain frequent and severe and the wind becomes a tempest

They are isolated from the rest of the world their land will grow nothing but potatoes and barley, they are dependent for food on bringing it from the mainland when the weather per-

(Continued on Page 47)

1 Open air Mass at St Anne 2 The Basilique 3 S R O sign at the Basilique 4 Here they come 5 The Scale Sancta 6 Returning from Benediction 7. Women from the Ile de Sein

Hollywood Callboard

As this issue goes to press the following production activities were under way in the Hollywood Studios

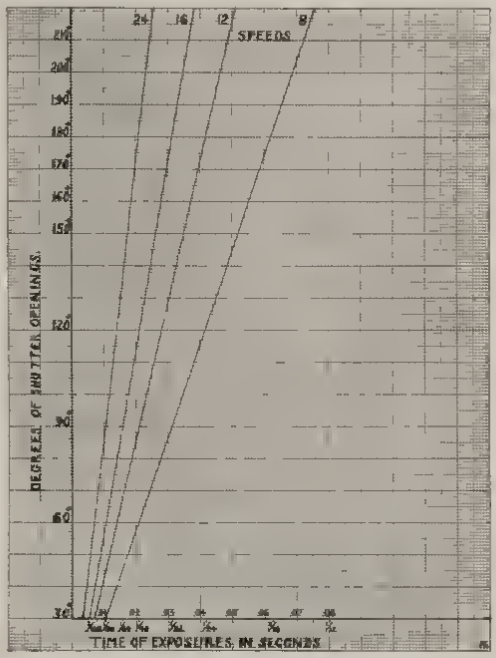
STUDIO	STAR	DIRECTOR	ASST DIR	CAMERAMAN	STORY	SCENARIST
COLUMBIA	All Star Jack Holt O Brien-Clarke	Roy W Neill John F Dillon Howard Higgin	Cene Anderson Dave Selman C C Coleman	O Connell Teddy Tetzlaff Joe Walker	The Feathered Serpent Untitled 'Final Edition	Uncredited
DARMOUR	All-Star	Phil Whitman	J A Duffy	John Brown	Air Eagles"	Uncredited
FOX	All-Star James Dunn Watkins Kirkland McLaglen-Mack Oland Watkins	Seymour Felix Sidney Lanfield Wm C Menzies Alan Dwan John Blystone	Jack Boland C Woolsten hulme Walter Mayo E Rettig Jasper Blystone	G Schneiderman James Howe John Mescall G McWilliams	'Stepping Sisters 'Dance Team Circumstance' 'While Paris Sleeps Charlie Chan's Chance'	Howard Comstock E Burke Andrew Soutar Woon Dwan Connors-Klein
INTERNATIONAL STUDIO	Bela 4-King-Barton Tyron-Reynolds	J P McGowan Frank Strayer	Wm Nolte Arf Black	Ed Kull Jules Cronjager	Human Targets' Passport to Paradise"	Geo Morgan Scott Darling
METRO-GOLDWYN-MAYER	J Weissmuller Jackie Cooper All-Star Marie Dressler All-Star Robert Montgomery	W S Van Dike Harry Pollard Chas Brabin Clarence Brown Tod Browning Robt Z Leonard	Arthur Rose Unassigned Red Golden Chas Dorien Earl Taggert Harry Bouquet	Hal Rosson Unassigned N Brodine Oliver Marsh M Gerstad Geo Barnes	Tarzan Limpy 'City Sentinel' Emma' Freaks' 'Courage'	Wm Johnson Brabin-Mahin Vicki Baum Goldbeck-Gordon Fred Lonsdale
PARAMOUNT	Dietrich-Brook-Wong Cooper-Coogan Chevalier-MacDonald Holmes-Hopkins Brook-Holmes All Star All Star	Josef von Sternberg Norman Taurog George Cukor Wm C DeMille Ernest Schoedsack Lloyd Corrigan Frank Tuttle	Ed Martin A Jacobson Geo Hippard Russ Mathews Unassigned Jack Mintz Robert Margolis	Lee Garmes Arthur Todd Victor Milner Karl Struss Rex Wimpy Charles Lang Henry Sharp	Shanghai Express Sooky One Hour With You' 'Two Kinds of Women Lives of a Bengal Lancer' No One Man Second Chances	Jules Furthman Jones-McNutt S Raphaelson B Glazer DeVino Buchman Heath-Buchman-Leahy Jos Mankiewicz
R K O -PATHE	Bill Boyd Ann Harding Constance Bennett	Albert Rogell Tay Garnett E H Griffith	Frank Shaw Robt Fellows E J Babelle	Ted McCord Lucien Andriot Hal Mohr	Bad Timber Prestige Lady With a Past'	Jackson-Ryan Graham John Austin Parker
TEC-ART	Allied Pictures Willis Kent Chandler	Chester Franklin Mandy Schaefer	Wilbur McGaugh Buddy Shyer	Harry Newman Bill Noble	File 113 Sagebrush Romeo	Uncredited Oliver Drake
WARNER BROS -1ST NAT'L	Lil Dagover Winnie Lightner Fairbanks-Blondell Wm Powell	Michael Curtiz Lloyd Bacon Alfred E Green Mervyn Le Roy	Joe Barry T C Wright Al Alborn G Hollingshead	Ernest Haller Dev Jennings Sol Polito Robert Kurlee	The Captain s Wife Manhattan Parade 'Union Depot 'High Pressure	Thew Mandel-stamm Lord-Branch Nicholson-De Leon O Garretson

Shutters in 16 mm. Cameras

ONE of the outstanding differences in design between the professional 35 mm and the 16 mm camera for the amateur is in the construction of the shutter

The former has a movable shutter which may be operated at any opening from 0° to 170° or 180 At the same time it provides an automatic dissolve for "fade in" or "fade out"

The shutters in the 16 mm cameras are built much simpler They have a fixed opening, which makes fades impossible, and leaves the entire control of exposure up to the lens stop However, this does not mean that all the shutters on cine cameras have the same opening



Exposure Chart

The following table gives an idea of the approximate degrees of shutter opening for various 16 mm cameras

Filmo 70	210°	Filmo 75	170
De Vry, 16 mm	180°	Cine-Kodak	170°
Cine-Nizo	180	Agfa-Ansco	10

Victor Cine Camera 170

It may be seen that the difference in exposure for these cameras is sufficient to produce various results under otherwise identical conditions The equivalent time of exposure for the above cameras may be readily taken from the accompanying chart which is computed for the four camera speeds most widely used in ordinary work The exposure time is given in 1/100 parts as well as in other fractions of a second, which may be found on the many exposure or photometers now on the market This is done to adapt any exposure meter, even those intended for still work alone, readily to the requirements of the 16 mm worker —Hatto Tappenbeck, A S C

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*Exhibited London Salon, Royal Salon, Paris Salon, Madrid, Barcelona Warsaw, Pittsburgh, Toronto Edinburgh, and Los Angeles His work in addition to that listed above, appears constantly in national advertising pages A [illegible] of Mr Connell's work now on exhibit at the school galleries

In the Art Director's Field

ONE of the most important elements in the making of motion pictures is the designing of the sets Various art directors have various methods which they follow Apparently, most of the methods are very satisfactory, for the settings of the American-made motion pictures are outstanding From time to time the methods of these art directors will be discussed, but it seems particularly fitting this month to look into the work of Mr Max Ree, who received the Academy award last month for his art direction in "Cimarron"

Mr Ree is a firm advocate of modelling your sets Every set that he designs is first created in miniature A glance into his department at RKO-Radio Studios would give the ordinary layman the impression that someone was preparing a Christmas present for a small boy, for there are countless castles, houses, tiny streets, tiny lamp posts and what-not However, these creations are models for future sets, designed with exacting precision; models over which directors and cameramen ponder in stern reality

According to Mr Ree, building your sets in miniature affords a much clearer perception of the requirements of the picture production problems than is afforded by either sketches or drawings The director and the cameraman can more clearly visualize the action that is to take place The director can plan out his action with no fear of having his plans go wrong because he can work this action out practically on the model sets, and many times discovers that some certain bit of action must be changed because it would not be practical, or would cost far in excess of its worth to the picture

The cameraman can study the model set and work out his camera angles and decide long in advance upon his lighting sources and effects Many times vast savings can be brought about because the cameraman and the director can see, practically, that only a small section of a set need be built to furnish the effect desired The building of a gigantic set, with walls and surfaces of vast extent is an unnecessary waste when only a small portion is to be covered by the camera angles—this can be determined in the model sets to great advantage, and costs can be cut

Mr Ree is one of the few art directors who also designs the costumes for the players He points out that by having his sets in models before him he can more easily decide upon costume and set dressing than can be done by mere sketches or drawings

Sound, according to Mr Ree, has been a definite aid in creating atmosphere and gives the art director a new medium of expression Only a small corner of a walled courtyard is shown on the screen, but the sound of tramping feet will give an impression that in the old days had to be shown by vast sets and marching soldiers Thus mood is expressed at much less cost, if intelligently studied and handled

Mr Ree with some of his Set Models.

DeSart Joins General Sound

ALBERT W DeSart, formerly head of the sound department at the Paramount Studios, Hollywood, the sound department which won the Academy award for best sound reproduction of the past year, has now joined the General Sound Corporation of Hollywood, as Director of Sound.

Mr DeSart has had many years of experience in sound and radio, having been a government radio inspector when the radio was in its infancy At one time he was district superintendent of the Northern District for the Marconi Company In commenting upon his connection with General Sound he says

"Independents will have to give more consideration to recording procedures—It is impossible to get good results with improper acoustical conditions Improper recording is very costly and 'quickies' today are made so fast that competence and experience are very necessary

◆

Light Intensity Measured By New Camera Invention

DEVELOPMENT of a new motion picture camera device for measuring light intensities, enabling the cameraman to maintain all exposures no matter how varied may be the lighting conditions, to a constant negative density, has been announced by M Lasky, inventor, and is being marketed by the Graphometer Corp. of New York

Light intensities of the device, which is small and compact and adaptable to Bell & Howell or Mitchell cameras, are obtained by direct meter reading and with its use any desired light effect can be gauged before photographing with rapid accuracy The photographic accuracy of the device, the inventor claims, makes it especially adaptable for color work

◆

Vallen Curtain Control Has High and Low Speed

A NEW CURTAIN control to be known as the Aero-Speed Control and said to have a curtain speed of 228 feet per minute and a slow speed of 40 feet per minute, as well as operating at any speed between these limits, has been brought out by the Vallen Electrical Co , Akron

By a simple change of two parts, it is declared a new speed can be obtained and the unit can be used for an entirely different purpose With the use of this device, huge curtains can be operated by remote control from an electric push-button station which is installed in the most convenient location

The device is operated by a single push-button, is noiseless, compact and will not coast, the company declares

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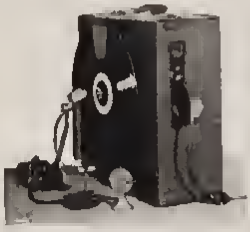

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First Prize: $100.00 Second Prize: $50.00
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Keyes Opens Studio

DONALD B. KEYES, well known member of the American Society of Cinematographers, has opened a portrait studio at No. 127 North Larchmont, Hollywood. It is called the Studio of Donald Biddle Keyes, and he has been swamped with business since the opening day. Mr. Keyes, long a motion picture photographer, has always been an outstanding portrait man, having started his picture work as a "still" man. He first introduced the idea of a studio having its own portrait studio.

•

S. K. Wolf Honored

S. K. WOLF, Director of the Acoustic Consulting Service of Electrical Research Products, has been honored by election as a Fellow of the Acoustic Society of America. He has also been appointed a member of the Society's Standardization Committee.

•

Amateur Movie Making

(Continued from Page 32)

action may be photographed equally well from various angles, when going through the movements required.

Those who have forsaken the still camera for the motion pictures should go back to the former, and use it in addition to advantage as an easy, sure, and inexpensive means of improving the latter and cutting down the waste of uninteresting film footage, which invariably occurs, but can be reduced to a minimum by an adequate study of various photographic conditions.

•

Principles of Sensitometry

(Continued from Page 28)

are desired but it does not seem probable that sufficient precision can be obtained for standardized sensitometric work.

Another type of intensity scale instrument is that designated as the tube sensitometer which consists of a series of tubes or cells of equal length at one end of which is placed the photographic plate, the other ends of the various tubes being closed by opaque plates containing apertures of variable areas. If these apertures are properly illuminated the intensity of the light acting on the photographic plate at the other end of the tubes will be directly proportional to the areas of the apertures. It is difficult with this type of sensitometer to obtain a very wide range of illumination without having as a result a very cumbersome instrument.

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New Projector From Bell & Howell

A NEW FILMO projector, the Model J, is announced by Bell & Howell With a picture brilliance asserted to be practically 30% greater than that afforded by even the Filmo 57-GG, it is hailed by its makers as marking "the most outstanding advance in the history of personal movie projection" Life-size movies of theatre quality, it is stated are easily projected by it in the home, classroom, or auditorium

The new Filme Model J Projector

For months, we are informed engineers have been engaged in perfecting this new projector Not only are superlative performance and ease of operation claimed for it, but it has a handsome, luxurious appearance and sets a high mark in beauty of line and finish The Model J is low-built with a large base designed to afford desirable stability, as well as making for beautiful proportions

The new projector is entirely gear-driven and hence dispenses with all belts and chains The gears are fully encased This is asserted to be the first fully gear-driven 16 mm projector

The notable increase in picture brilliance, which is said to have been demonstrated in exhaustive tests, has been secured by an improved 375 watt lamp, a new Cooke 2 inch F 1 5 projection lens, improved condenser, a large reflector and a refined reflector adjustment And there is a novel light trap whose purpose is to prevent the escape of stray illumination

The above are only a few of the new and distinctive features of this new projector which, the manufacturers state, is bound to be a sensation in the 16 mm world Other important innovations include a completely automatic rewind; airplane type cooling which supplements the well-known Filmo tornado fan cooling system, and an adjustable built-in pilot light, which can be slid back into the base when not needed and which goes on when the projection lamp is turned off, and vice versa Conveniently spaced and clearly marked controls and switches facilitate operation

Along with the many new features we are told that "The Model J retains such basic Filmo Projector principles as the nine-to-one side tension film movement mechanism with its automatic framing of steady, flickerless pictures; the powerful direct lighting system controls for reversing and stopping for still projection, and adaptability for Kodacolor"

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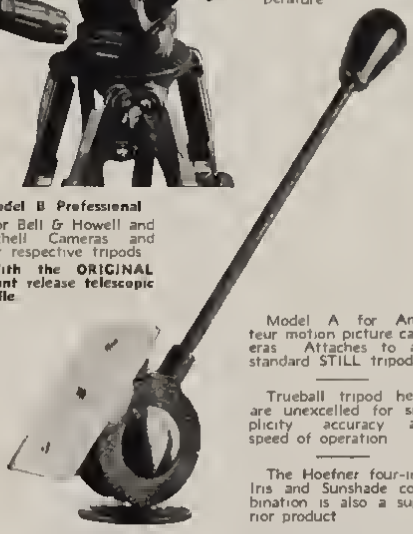

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Auxiliary Parallax Viewfinder for Filmo 75 Cameras

AN AUXILIARY parallax viewfinder for the Model 75 Filmo camera has been developed by the Bell & Howell Co It is designed to be detachably mounted on the door of the camera at the top

The new finder affords a much larger image of the picture area (approximately three times) than is given by the regular built-in viewfinder of the 75 camera It is unusually convenient to use while permitting greater accuracy in close-up work

The new finder by being mounted at the top of the camera affords the greatest possible convenience to the movie maker. In fact, he can easily use the finder without removing his hat Its location, of course, places it at some distance from the lens, but a simple and ingenious graduated slide device, placed on a bias, permits of instantaneous compensation, at one operation for horizontal and vertical offsets This device is corrected for a range from infinity down to two feet By setting the slide at the two-foot mark, for example, finder and lens are centered vertically and horizontally at an object two feet away The new finder is thus particularly important for close-up work especially for title making

While the field shown by the new finder is the same as that of a 20 mm lens, fields of other lenses of longer focal lengths may be etched on the finder face Of course, the regular built-in finder will continue as a standard feature of the camera, and the camera will still be sold without the new finder if so desired

The Model 75 Filmo Camera with detachable parallax finder can be had in a special case of distinctive design for those who wish to have the finder permanently attached to the camera door However, attaching or detaching the finder from its mounting on the camera door is merely a matter of seconds It slides on a dovetail plate attached to the door.

Those who wish to have their present 75 s adapted so as to permit of the use of the new finder need simply have the mounting plate attached to the camera door

◆

Rockne Shorts for 1,500 Houses

R-K-O-Pathe's series of Knute Rockne football shorts were booked by 1,500 houses to start playing during the first five days of national release says A H Schnitzer, short subject sales manager on Ned E Depinet s staff Rockne himself is seen and heard in the six pictures

Eliminating Small Producers in the German Field

NUMEROUS notes forwarded to the Bureau of Foreign and Domestic Commerce indicate the gradual demise of the small European producers unable to maintain production under sound film conditions It is not apparent that this extinction of the so-called mushroom producer has yet to reach its true level, for in Germany during 1930, 44 companies turned out one or two films each, as compared with 61 companies in 1929 42 in 1928, 62 in 1927, and 60 in 1926 These figures are significant Though these companies registered lowest numerically in 1928—Germany's peak production year, when only the rankest kind of mushroom producer confined himself to one or two films—61 producers of this category operated during 1929, practically the last year of the silent film era In 1930, the first year of the sound film era, the number of mushroom producers (44) would appear to indicate that the death knell had not yet been sounded, notwithstanding that this number was 28% under that for the preceding year It does, however, represent a tremendous decline when it is considered that many of these producers were, in reality, making what will prove to be their last attempt at production, unless Tobis royalties charges are considerably reduced, and that 1931 will see a still smaller number remaining

Dr Alexander Jason who occasionally writes in the German trade press on economic surveys of film production, recently published an article in the French trade press. While his figures as they relate to the number of productions turned out annually do not agree with official statistics that have been previously reported they do substantiate his purpose in showing the decrease of these mushroom producers and in a sense the strangle hold that Tobis is getting on the German film industry Dr Jason's article in translated form is submitted below The department's usual waiver of responsibility accompanies this translation

Statistical material available on film production in Germany during 1930, the first sound film year is a very interesting subject to study from various angles

The change over to sound film obviously necessitated financial sacrifices, especially during the early part of the sound film era, and, owing to entirely new problems and the lack of experience in technical and economic phases considerable insecurity resulted in the production field

Today the situation is entirely different, the foundation of sound film production has been clearly established and the statistical material available in this connection for 1930 can well be taken as a basis for an exact study of the economics of the film situation

If it is considered that the average production cost of a silent and of a sound film is 175,000 and 275,000 marks, respectively (the latter amount including 175,000 marks actual production costs and 100,000 marks for sound film royalties), it is easy to estimate the capital spent on film production in Germany during the period from 1926 to 1930, inclusive

It is, of course, obvious that the production costs of each individual film differ considerably, in fact, they have varied between 20,000 and 2,000,000 marks during the 4-year period from 1926 to 1929, so a very conservative estimate may fix the average production price of a silent film at 175,000 marks Taking this average cost as a basis the total amount spent on film production during the 5-year period in question was probably as follows 1926, 185 feature films, total cost 32,375,000 marks, 1927, 242 feature films, total cost 42,350,000 marks 1928, 224 feature films, total cost 32,200,000 marks, 1929, 183 feature films, total cost 32,025,000 marks, 1930, 146 feature films, total cost 35,550,000 Total 5-year period, 980 feature films, total cost 174,500,000, yearly average 196 feature films; average yearly cost 36,300,00 marks

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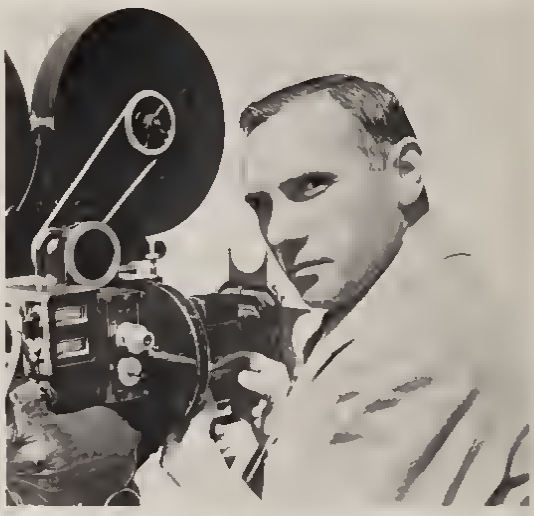

ONE of the most outstanding and valuable series of articles ever offered to the Amateur Movie Maker by any magazine, will start in the January issue of the AMERICAN CINEMATOGRAPHER

This series of articles will be written by a group of the most famous cameramen in the motion picture world, men who photograph the big productions and the big stars, men whose names are familiar wherever pictures are shown The articles will be helpful and instructive, and no Amateur should miss any of them, for they will include home lighting, use of filters, composition, night photography and other important technical subjects

The first of the series will be written by Jackson J Rose, A S C , a cameraman who has been photographing big productions and stars for the past twenty years. Hardly a star of any importance who has not acted before the camera of Mr Rose Since sound came in we find Seed", "The Lady Surrenders", "Reckless Living" and "Law and Order" among his pictures And we all remember the silent pictures, "The Dangerous Age' , "Smouldering Fires", "Midnight Sun", "We Americans", "Love Me and the World is Mine" These are a few of his silent pictures Watch for the first of this great series

◆

Filmo Topics

ONE of the most interesting publications for amateurs is Filmo Topics, the monthly magazine published by the Bell & Howell Company of Chicago This magazine is sent free if you send your request to Bell & Howell The December issue contains many useful items, among them are the following

Your Christmas Day Movie Let these suggestions help you do justice in filming your 1931 Christmas activities, which will assuredly merit a little extra effort on the part of the cameraman.

If a Filmo Camera Could Talk This is what it would say on a trip to Mexico

Titling Your Films No 12 Clever animated titles—the revolving reel, fade-in and fade-out, a trade mark a la M-G-M

Victor Issues Special Instructions For Making Titles With Victor Cameras

THE VICTOR Animatograph Corporation, Davenport, Iowa, has recently prepared and is issuing on request, a 9½x 11" blue print containing explicit instructions for setting up Victor Cameras for title making, either with or without a title board

The instructions cover four sizes of title cards, ranging from 5½x7" to 12x15" They show the exact distances at which the cards should be placed from the camera and give instructions for centering the titles and for securing a sharp focus

Owners of Victor Cameras interested in title making may secure copies of these blue prints by addressing the Victor Animatograph Corporation, Davenport, Iowa

◆

Babbling About Brittany

(Continued from Page 36)

mits, and they live always in danger of having their homes swept into the sea by one of the great periodic tidal waves

1896-1897 was a most disastrous year, they had to seal up their cottages and remain inside the tempests were so severe and the seas so high, the light house was destroyed and the inhabitants barely escaped wholesale death by starvation

There are people who were born there, who have never left this little place, and to whom therefore even a tree is unknown except it may be through a picture, for there are neither trees nor shrubs on this spot, which seems truly God-forsaken

Yet human beings live there Why they do so when they could go to the mainland seems hard to say They were born there While the land is barren and hard the fish provide a rich and splendid harvest, and in a world where it is hard enough to make a living they feel 'it is better to endure the ills they know than fly to others that they know not of'

Of such is composed the land of Brittany and the Bretons Colorful Different Interesting Hospitable Old-world still Charming

And I find with reluctance and regret that I have finished my babbling, that my last chapter of rambling chatter is at an end, and I hope those who have seen these places, met these people, find I have set them down just as they are, and that in reading they may renew in some of them their own happy experiences, and that I may have excited the curiosity of others who have never been there, to take a chance and go

If they do they will ever after have a friendly feeling towards me for having so persuaded them, for I do believe that nowhere else can you find more of old world interest and yet modern comfort as far as food and lodging are concerned, than in this lovely province

Have I bought back all there is to tell, that is, all there is worth while? Not a hundredth part Have I brought back only the best? There is no "best" where all is interesting, and I have only scratched the surface of places that should be seen

Go and forage them out for yourself

Go, as I said at the beginning, without prejudices

You will have to take everything with a strong percentage of religion, but though you may smile indulgently at their old fashioned faith, their complete acceptance of things that to you seem absurd, you will finally come away with a good deal of respect for a religion that comforts, upholds and sustains these lovely peasant and fisher folk

A very great scientist once said "I have studied for fifty years, and after all I have only arrived at the faith of a Brittany peasant"

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J. E. BRULATOUR, Inc.

October 19, 1931.

Mr. George Mitchell,
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Dear George:

My trip to the Arctic this summer with Donald B. MacMillan was a great one, and I want to tell you how well your camera behaved on what I figure was about the toughest trip a camera could go through. In twelve weeks along the North Atlantic we only had thirteen days of sunshine, the rest wae storms and fogs and salt water over everything.

We lugged that camera in an airplane all over the mountains, we packed it all over these mountains and glaciers of Baffinland and Labrador, on deck the Schooner Bowdoin in all kinds of weather, hunting walrus and seals with the Eskimoes in little boats, and sorry to say very seldom did it ever get put away in its case, for we had to eliminate weight so occassionally rolled it up in a blanket.

I had spare parts along with me but never needed them. The weather acted on the leather belts and many serious buckles would have happened had it not been for your little trip which cut the motor at the right time.

Something like thirty thousand feet of Multi-Color Du-Pack as well as the Black and White was run through it without any mechanical trouble at all and on the screen it was as sharp as could be and everyone well pleased with the results.

Auoh - In - I.

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